GENERAL NOTES

1. CODES/REGULATIONS:
-CONSTRUCTION TO CONFORM TO THE 2018 INTERNATIONAL RESIDENTIAL CODE (IRC), WASHINGTON STATE LAWS AND REGULATIONS, CURRENT WASHINGTON STATE RESIDENTIAL ENERGY CODE AND VARIOUS CODES IMPOSED BY LOCAL AUTHORITIES.
-A SEPARATE PERMIT MAY BE REQUIRED FOR PLUMBING, ELECTRICAL, AND/OR MECHANICAL WORK AS APPLICABLE.
-A COPY OF THE APPROVED PERMIT PLANS MUST BE ON THE JOB SITE DURING CONSTRUCTION.

2. CONTRACTOR'S RESPONSIBILITY:
-PRIOR TO CONSTRUCTION, THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBER SIZES.
-DO NOT SCALE CONTRACT DOCUMENTS.
-IF ANY DISCREPANCIES IN THE DRAWINGS OR FROM THE CODES ARE NOTED, ARCHITECT IS TO BE NOTIFIED IMMEDIATELY.
-ALL CHANGES MADE BY THE CONTRACTOR SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
-THE ARCHITECT SHALL NOT HAVE CONTROL OR CHARGE OF, AND SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, SAFETY PRECAUTIONS, ACTS OR OMISSIONS OR PERFORMANCE OF THE CONTRACTOR.
-CONTRACTOR SHALL BE RESPONSIBLE FOR THE PERFORMANCE AND WEATHERPROOFING OF THE ENTIRE BUILDING, ITS COMPONENT EQUIPMENT, AND PARTS.
-ALL STRUCTURAL SYSTEMS SUCH AS WOOD TRUSSES WHICH ARE TO BE COMPOSED OF COMPONENTS TO BE FIELD ERECTED SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE, AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.
-ALL WORK MUST FOLLOW CURRENT REF RULES AND REQUIREMENTS AS DEFINED BY THE EPA AND THE STATE OF WASHINGTON
-ALL WASTE AND REFUSE CAUSED IN CONNECTION WITH THE WORK SHALL BE REMOVED FROM THE PREMISES AND DISPOSED OF BY THE CONTRACTOR. THE PREMISES SHALL BE LEFT CLEAR AND CLEAN TO THE SATISFACTION OF THE OWNER.
-CONTRACTOR SHALL DESIGN AND INSTALL SHORING AS REQUIRED TO PERFORM WORK. ENGINEERING, CONSTRUCTION AND SAFETY OF THE SHORING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
-FOR ALL NEW CONSTRUCTION OR ADDITIONS DESIGNED WITHIN 1'-0" OF THE HEIGHT LIMIT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE SURVEYOR TO VERIFY THE ELEVATION OF THE STRUCTURE AS IT IS BEING BUILT TO VERIFY ANY ELEVATION DISCRPANCIES THROUGHOUT CONSTRUCTION. ELEVATIONS SHOULD BE VERIFIED FOR EACH FLOOR LEVEL PRIOR TO PROCEEDING WITH THE NEXT FLOOR OF FRAMING: TOP OF FOUNDATION, TOP OF SUBFLOOR, TOP PLATE AND RIDGE ELEVATIONS SHOULD BE VERIFIED DURING CONSTRUCTION. CONSULT ARCHITECT FOR CLARIFICATION PRIOR TO CONSTRUCTION.

3. SOILS:
-FOUNDATION DESIGN IS BASED ON AN ASSUMED AVERAGE SOIL BEARING OF 2,000 PSF OR PER GEOTECHNICAL REPORT. ALL FOOTINGS SHALL BE CAST ON UNDISTURBED FIRM NATURAL SOIL OR COMPACTED SOIL OF 2,000 PSF BEARING CAPACITY AT LEAST 1'-6" BELOW LOWEST ADJACENT GRADE, AND FREE OF ORGANIC MATERIALS. FOOTING EXCAVATION SHALL BE FREE OF LOOSE SOILS, DEBRIS, AND FREE WATER AT ALL TIMES. THIS OFFICE TAKES NO RESPONSIBILITY IN VERIFYING THE ACCURACY OF ENGINEERING DATA SUPPLIED BY OTHERS.

4. ATTIC REQUIREMENTS:
-APPLY ROOFING IN ACCORDANCE WITH IRC CHAPTER 9. PROVIDE ATTIC VENTILATION AS INDICATED ON DRAWINGS AND AS OUTLINED IN IRC SEC R806.
-THE NET FREE VENTILATING AREA SHALL BE NOT LESS THAN 1/150 OF THE AREA OF THE SPACE VENTILATED, EXCEPT THAT THE AREA MAY BE 1/300 PROVIDED AT LEAST 50 PERCENT OF THE REQUIRED VENTILATING AREA IS PROVIDED BY VENTILATION LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED AT LEAST 3 FEET ABOVE EAVE OF CORNICE VENTS WITH THE BALANCE OF THE REQUIRED VENTILATION PROVIDED BY EAVE OR CORNICE VENTS. (IRC SEC R806).
-ATTIC ACCESS: MINIMUM 22" x 30" WITH MINIMUM 30" HEADROOM, UNOBSTRUCTED, READILY ACCESSIBLE OPENING. IRC SEC R807. ACCESS DOORS SHALL BE WEATHERSTRIPPED AND INSULATED TO A LEVEL EQUIVALENT TO THE INSULATION ON THE SURROUNDING SURFACES.
-IN ROOMS NOT PROVIDED WITH AN OPERABLE WINDOW OF 1.5 SQ. FT. OR GREATER, A MECHANICAL VENTILATION SYSTEM CAPABLE OF PROVIDING 5 AIR CHANGES PER HOUR SHALL BE PROVIDED.
-VENT DRYER, BATH FANS, AND RANGES/OVENS TO THE OUTSIDE.

5. VENTILATION:
-VENT FANS SHALL TERMINATE AT THE EXTERIOR OF THE BUILDING PER IRC SECTION M1502.3 AND IMC SECTION 501.3.
-INSULATE ALL DUCTS OUTSIDE OF CONDITIONED SPACE PER WA STATE ENERGY CODE.
-KITCHEN RANGE HOODS: RANGE HOODS CAPABLE OF EXHAUSTING MORE THAN 400 CFM REQUIRE MAKE-UP AIR PER IRC M1503.4.

6. GLAZING:
-TO BE IN COMPLIANCE WITH IRC SEC R308 AND WASHINGTON STATE SAFETY GLASS LAW, EXCEPTIONS ARE AS OUTLINED IN IRC SEC R308.
-GLAZING IN LOCATIONS SUBJECT TO HUMAN IMPACT SUCH AS GLASS IN DOORS, GLAZING WITHIN 24" ON EITHER SIDE OF A DOOR OPENING, GLAZING CLOSER THAN 18" TO A FLOOR, SHOWER DOORS AND TUB ENCLOSURES SHALL BE WIRE REINFORCED, TEMPERED GLASS, LAMINATED SAFETY GLASS OR SHATTER RESISTANT PLASTIC.
-SLIDING GLASS DOORS TO BE SAFETY GLAZING, LAMINATED OR TEMPERED GLASS.
-SHOWER ENCLOSURES SHALL BE APPROVED WIRE REINFORCED, TEMPERED OR LAMINATED SAFETY GLASS OR SHATTER RESISTANT PLASTIC.
-GLAZING WITHIN 18" OF FLOOR AND GREATER THAN 18" IN LEAST DIMENSION SHALL COMPLY WITH IMPACT LOADS. SEE PLANS.
-ALL EXTERIOR WALL GLAZING SHALL BE DOUBLE GLAZED, UNLESS NOTED OTHERWISE, AND COMPLY WITH STATE OF WASHINGTON ENERGY CODE.
-EGRESS IN EVERY SLEEPING ROOM SHALL HAVE A MINIMUM NET CLEAR OPENING OF 5.7 SQ. FT. THE MINIMUM NET CLEAR OPENING HEIGHT DIMENSION SHALL BE 24", MINIMUM NET CLEAR OPENING WIDTH OF 20" AND A FINISHED SILL HEIGHT NOT MORE THAN 44" ABOVE THE FLOOR. IRC SEC R310.

7. ENERGY:
-ALL MATERIALS, WORKMANSHIP AND CONSTRUCTION SHALL CONFORM TO IRC REQUIREMENTS AND THE WASHINGTON STATE ENERGY CODE, LATEST EDITION. VERIFY ALL CONDITIONS BEFORE PROCEEDING WITH WORK.
-APPLICATION AND INSTALLATIONS OF INSULATION AND VAPOR BARRIERS SHALL COMPLY WITH STATE OF WASHINGTON THERMAL INSULATION STANDARDS.
-BUILDING AIR LEAKAGE TESTING, PER SEC 502.4.5, IS REQUIRED PRIOR TO FINAL INSPECTION. THE TEST RESULTS SHALL BE POSTED ON THE RESIDENTIAL ENERGY COMPLIANCE CERTIFICATE.
-EACH DWELLING UNIT IS TO HAVE ONE PROGRAMMABLE THERMOSTAT FOR REGULATION OF TEMPERATURE PER SEC 503.2.1.
-A SIGNED AFFADAVIT DOCUMENTING THE DUCT LEAKAGE TEST RESULTS SHALL BE PROVIDED TO THE BUILDING INSPECTOR PRIOR TO AN APPROVED FINAL INSPECTION.
-DUCT LEAKAGE TEST RESULTS SHALL BE PROVIDED TO THE BUILDING INSPECTOR AND HOMEOWNER PRIOR TO AN APPROVED FINAL INSPECTION.
-MINIMUM 75% OF PERMANENTLY INSTALLED LAMPS IN LIGHTING FIXTURES SHALL BE HIGH EFFICACY LAMPS PER SEC 404.1.
-WHERE THE PRIMARY HEATING SYSTEM IS A FORCED-AIR FURNACE, AT LEAST ONE THERMOSTAT PER DWELLING UNIT SHALL BE CAPABLE OF CONTROLLING THE HEATING AND COOLING SYSTEM ON A DAILY SCHEDULE TO MAINTAIN DIFFERENT TEMPERATURE SET POINTS AT DIFFERENT TIMES OF THE DAY. THE THERMOSTAT SHALL ALLOW FO, AT A MINIMUM, A 5-2 PROGRAMMABLE SCHEDULE (WEEKDAYS/WEEKENDS) AND BE CAPABLE OF PROVIDING AT LEAST TWO PROGRAMMABLE SETBACKS PER DAY.

8. STAIRS:
-MINIMUM HEADROOM 6'-8"; MINIMUM TREAD 10"; MAXIMUM RISER 7 3/4"
-HANDRAIL: REQUIRED AT ALL STAIRS WITH MORE THAN 4 RISERS PER IRC 311.7.8. MINIMUM 34" AND MAXIMUM 38" ABOVE TREAD NOSING. OPEN SIDES OF STAIRS MORE THAN 30" ABOVE ADJACENT FLOOR SHALL HAVE HANDRAILS AND GUARDRAILS. HANDRAIL TO BE 1 1/4"-2" CROSS SECTIONAL DIMENSION AND 1 1/2" AWAY FROM WALL.
-GUARDRAIL: SHALL BE MIN 36" IN HEIGHT WHERE ADJACENT SURFACE OR GRADE IS 30" OR MORE BELOW. RAILINGS SHALL BE SPACED TO NOT ALLOW THE PASSAGE OF A 4" SPHERE PER IRC 312.1.
-INSTALL FIRE BLOCKING AT MID-STRINGER SPAN AND AT WALL ALIGN STRINGER.
-COVER WALLS AND SOFFITS OF USABLE SPACE UNDER STAIR WITH 5/8" TYPE "X" GYPSUM WALLBOARD.

9. INSULATION:
-INSULATION TO MEET THE CURRENT WASHINGTON STATE ENERGY CODE REQTS FOR TABLE R402.1.1, TABLE R402.1.3 AND SECTION R402. REFER TO PRESCRIPTIVE TABLE ON SHEET 01.
-EXISTING WALL AND FLOOR CAVITIES EXPOSED DURING CONSTRUCTION FOUND UNINSULATED, OR WITH DAMAGED INSULATION (DISCOLORED, WET, DAMAGED, OR DETERIORATED) SHALL BE FILLED WITH R-15 INSULATION AT 2X4 FRAMING AND WITH R-21 INSULATION AT 2X6 FRAMING. REF SEC R503.1.1-EXCEPTION 2..
-WALLS TO BE INSULATED WITH MINIMUM R-21 INSULATION. BELOW GRADE WALLS TO BE INSULATED WITH MINIMUM R-21 INSULATION, ALLOW FOR THERMAL BREAK BETWEEN FLOOR SLAB AND BASEMENT WALL UNLESS NOTED OTHERWISE.
-ROOF AND CEILING INSULATED WITH R-49 BLOWN IN AT FLAT CEILINGS AND R-38 H.D. BATT AT VAULTED AREAS UNLESS NOTED OTHERWISE.
-ROOF: ALLOW FOR A MINIMUM 1" CLEAR BETWEEN TOP OF INSULATION AND BOTTOM OF SHEATHING FOR VENTING UNLESS NOTED OTHERWISE.
-VENTING IS REQUIRED IN EACH JOIST SPACE. WHERE CONTINUOUS VENTING WITH A JOIST SPACE IS INTERRUPTED BY A HEADER (FOR EXAMPLE AT A SKYLIGHT OR HP), PROVIDE (2) 1 1/2" VENTING HOLES AT THE TOP OF THE RAFTER AT THE HEADER TO ALLOW FOR CONTINUOUS THRU-VENTING INTO THE NEXT JOIST SPACE UNLESS NOTED OTHERWISE.
-FLOORS: INSULATED WITH R-30 BATT INSULATION OVER UNHEATED SPACE UNLESS NOTED OTHERWISE.
-SLAB-ON-GRADE: PROVIDE EXTRUDED RIGID CLOSED CELL R-10 INSULATION. INSULATION TO PROVIDE THERMAL BREAK BETWEEN SLAB AND FOOTING AND RUN FROM THE TOP OF THE SLAB TO THE BOTTOM OF THE FOOTING. INSULATION MAY BE INTERRUPTED FOR 6" EVERY 2'-0" TO ALLOW FOR DOWELING TO TIE SLAB AND FOOTING TOGETHER. UNLESS NOTED OTHERWISE.

10. GARAGE SEPARATION:
-REQUIRES 1/2" GWB ON THE GARAGE SIDE. 5/8" TYPE 'X' GWB WHERE THERE IS LIVING SPACE ABOVE. SUPPORTING COLUMNS, WALLS AND BEAMS USE 1/2" GWB PER IRC R302.6
-OPENINGS INTO A GARAGE: OPENINGS INTO A GARAGE SHALL HAVE A SOLID WOOD OR HONEYCOMB-CORE STEEL DOOR NOT LESS THAN 1-3/8" THICK, OR 20-MINUTE FIRE RATING. DOORS SHALL BE EQUIPPED WITH A SELF-CLOSING DEVICE PER IRC R302.5.1.

11. VAPOR BARRIERS:
- AN APPROVED VAPOR BARRIER SHALL BE INSTALLED AT EXTERIOR WALLS AND AT ALL ROOF DECKS, BELOW ENCLOSED JOIST SPACES WHERE CEILING FINISHES ARE DIRECTLY INSTALLED TO JOISTS, AND ANY OTHER WALL OR CEILING SURFACES WHICH RECEIVE INSULATION. THIS VAPOR BARRIER MAY BE A COMPONENT OF THE INSULATION MATERIAL. APPLICATION AND INSTALLATIONS OF INSULATION AND VAPOR BARRIERS SHALL COMPLY WITH STATE OF WASHINGTON THERMAL INSULATION STANDARDS.

12. FIRE SAFETY:
-SMOKE ALARMS/DETECTORS (S.D.): SMOKE ALARMS/DETECTORS SHALL BE INSTALLED IN ALL SLEEPING ROOMS, IN THE AREA OUTSIDE THE SLEEPING ROOM AND IN OTHER LOCATIONS PER IRC R314. POWER SOURCE AND INTERCONNECTION PER IRC.
-CARBON MONOXIDE DETECTORS (C.M.D.): SHALL HAVE AN APPROVED CARBON MONOXIDE ALARM INSTALLED OUTSIDE OF EACH SLEEPING AREA IN DWELLING UNITS AND IN EACH LEVEL IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS PER IRC315. SINGLE STATION CARBON MONOXIDE ALARMS SHALL BE LISTED AS COMPLYING WITH UL2034 AND SHALL BE INSTALLED IN ACCORDANCE WITH THIS CODE, NFPA 720-2012 AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
-CARBON MONOXIDE DETECTION SYSTEMS PER IRC 315.2 THAT INCLUDE CARBON MONOXIDE DETECTORS AND AUDIBLE NOTIFICATION APPLIANCES, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THIS SECTION FOR CARBON MONOXIDE ALARMS AND NFPA 720-2012, SHALL BE PERMITTED. THE CARBON MONOXIDE DETECTORS SHALL BE LISTED AS COMPLYING WITH UL 2075. WHERE A HOUSEHOLD CARBON MONOXIDE DETECTION SYSTEM IS INSTALLED, IT SHALL BECOME A PERMANENT FIXTURE OF THE OCCUPANCY.

13. CERTIFICATE & TESTING
- A PERMANENT CERTIFICATE SHALL BE COMPLETED BY THE BUILDER OR OTHER APPROVED PARTY AND POSTED ON A WALL IN THE SPACE WHERE THE FURNACE IS LOCATED, A UTILITY ROOM, OR AN APPROVED LOCATION INSIDE THE BUILDING. WHEN LOCATED ON AN ELECTRICAL PANEL, THE CERTIFICATE SHALL NOT COVER OR OBSTRUCT THE VISIBILITY OF THE CIRCUIT DIRECTORY LABEL, SERVICE DISCONNECT LABEL, OR OTHER REQUIRED LABELS. THE CERTIFICATE SHALL LIST THE PREDOMINANT R VALUES OF INSULATION INSTALLED IN OR ON CEILING/ROOF, WALLS, FOUNDATION (SLAB, BELOW-GRADE WALL, AND/OR FLOOR) AND DUCTS OUTSIDE CONDITIONED SPACES; U-FACTORS FOR FENESTRATION AND THE SOLAR HEAT GAIN COEFFICIENT (SHGC) OF FENESTRATION; NTE RESULTS FROM ANY REQUIRED DUCT SYSTEM AND BUILDING ENVELOPE AIR LEAKAGE TESTING DONE ON THE BUILDING; AND THE RESULTS FROM THE WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FLOW RATE TEST. WHERE THE IS MORE THAN ONE VALUE FOR EACH COMPONENT, THE CERTIFICATE SHALL LIST THE VALUE COVERING THE LARGEST AREA. THE CERTIFICATE SHALL LIST THE TYPES AND EFFICIENCIES OF HEATING, COOLING, WHOLE-HOUSE MECHANICAL VENTILAION, AND SERVICE WATER HEATING APPLIANCES. WHERE A GAS-FIRED UNVENTED ROOM HEATER, ELECTRIC FURNACE, OR BASEBOARD ELECTRIC HEATER IS INSTALLED IN THE RESIDENCE, THE CERTIFICATE SHALL LIST "GAS-FIRED UNVENTED ROOM HEATER", "ELECTRIC FURNACE", OR "BASEBOARD ELECTRIC HEATER", AS APPROPRIATE. AN EFFICIENCY SHALL NOT BE LISTED FOR GAS-FIRE UNVENTED ROOM HEATERS, ELECTRIC FURNACES, OR ELECTRIC BASEBOARD HEATERS.

14. LIGHTING EQUIPMENT
- NOT LESS THAN 90 PERCENT OF LAMPS IN PERMANENTLY INSTALLED LIGHTING FIXTURES SHALL BE HIGH-EFFICACY LAMPS
- FUEL GAS LIGHTING SYSTEMS SHALL NOT HAVE CONTINUOUSLY BURNING PILOT LIGHTS

15. FIRE SPRINKLERS
- INSTALL FIRE SPRINKLER SYSTEM TO ALL AREAS OF DWELLING UNIT. DESIGN TO BE PROVIDED BY OTHERS.
- SPRINKLERS SHALL BE LISTED RESIDENTIAL SPRINKLERS AND SHALL BE INSTALLED IN ACCORDANCE WITH THE SPRINKLER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- THE SPRINKLER SYSTEM SHALL BE DESIGNED BY A WASHINGTON STATE CERTIFIED SPRINKLER DESIGNER AND INSTALLED IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION STANDARD (NFPA) 13R WITH THE FOLLOWING ADDITIONS AND MODIFICATIONS:
  - A 1 1/2" MINIMUM WATER METER AND 2" MINIMUM SERVICE LINE IS REQUIRED FOR ALL 13R PLUS SPRINKLER SYSTEMS THIS IS NTE MINIMUM REQUIREMENT AND THE SPRINKLER CALCULATIONS FOR THE PROJECT SHALL DETERMINE THE ACTUAL METER AND SERVICE LINE SIZE. THE PLUMBING CODE MAY STILL REQUIRE A LARGER SIZE. A WATER METER PERMIT WILL NOT BE ISSUED UNTIL THE SPRINKLER PERMIT IS APPROVED.
  - A 1 1/2" MINIMUM BACKFLOW PREVENTER AND RISER IS REQUIRED
  - A 1 1/2" HOSE CONNECTION IS REQUIRED IN A VISIBLE LOCATION BESIDE THE GARAGE DOOR. THE CHECK VALVE SHALL REMAIN ACCESSIBLE FOR SERVICE. THE FDC PIPE RUN SHALL BE A MINIMUM OF 1 1/2" AND SHALL MAINTAIN THAT SIZE ALL HTE WAY TO THE RISER.
  - THE SPRINKLER SYSTEM SHALL HAVE INSTALLED A MEANS OF NOTIFICATION OF A WATER FLOW EVENT. INTERIOR: YOU MAY CONNECT THE WATER FLOW SWITCH TO THE SOUNDER SIDE OF THE LINE VOLTAGE SMOKE ALARMS. FIREX SMOKE DETECTORS USE PART # 0498 AND KIDDE WITH RELAY/POWER SUPPLY MODULE SM120X ARE CURRENTLY APPROVED FOR THIS PURPOSE. IF YOU CANNOT INTERFACE TEH WATER FLOW SWITCH TO SMOKE ALARMS THEN A SEPARATE HORN, BELL, OR SIREN, IS REQUIRED TO BE LOCATED CENTRALLY ON EACH LEVEL INCLUDING THE BASEMENT OR LOWEST LEVEL OF THE STRUCTURE FOR OCCUPANT WATER FLOW NOTIFICATION. EXTERIOR: AN EXTERIOR GRADE 8" POTTER BELL OR EQUIVALENT SHALL BE INSTALLED. THIS SHALL BE ABOVE THE FDC.
  - FULL COVERAGE OF ATTACHED GARAGES IS REQUIRED IT IS EXPECTED THAT ALL HEADS WILL OPERATE IN THE EVENT OF A CAR FIRE WITHIN THE GARAGE AND THE SYSTEM SHALL BE DESIGNED TO PROVIDE ADEQUATE FLOW. ANY GARAGES WITH MORE THAN 4 HEADS IN THEM NEED TO BE PIPED IN A MANNER THAT A LARGER FLOW IS AVAILABLE THAN WOULD BE NORMALLY DESIGNED. AN 1 1/2" FEED SHALL BE PROVIDED FROM THE RISER TO ANY HEADS GREATER THAN 4 WITHIN THE GARAGE.
  - THE SYSTEM DRAIN SHALL BE PIPED ALL THE WAY TO THE EXTERIOR OF THE BUILDING NAD NOT CAUSE DAMAGE TO LANDSCAPING WHILE WATER IS FLOWING. HOSE CONNECTIONS ARE NOT ALLOWED
  - A CABINET CONTAINING A MINIMUM OF TWO SPARE HEADS OF EACH TYPE AND A SPRINKLER WRENCH SHALL BE PROVIDED
  - ANY CRAWLSPACE THAT HAS A CONCRETE FLOOR AND A FULL SIZEDOOR SHALL BE PRESUMED TO BE A FUTURE STORAGE ROOM AND SPRINKLER COVERAGE SHALL BE PROVIDED.
  - ALL BATHROOMS REGARDLESS OF SIZE SHALL BE COVERED
  - ALL CLOSETS IN COMMON AREAS OR EGRESS PATHWAYS SHALL BE COVERED
  - WATER FLOW MONITERING BY A CENTRAL STATION IS REQUIRED
  - ANY COVERED PORCH WITH A NATURAL GAS OUTLET IS REQUIRED TO HAVE SIDEWALL SPRINKLER COVERAGE USING AN INTERMEDIATE TEMPERATURE SPRINKLER HEAD.

PROJECT INFORMATION

PROJECT OWNER:	MARIA AND DAVID FEDERMAN 6716 AND 6712 168TH AVE SE BELLEVUE WA 98006
PROJECT ARCHITECT: PROJECT DESIGNER:	HEIDI HELGESON LISA MONTALVO/MARIA RIBEIRO H2D ARCHITECTURE + DESIGN 23020 EDMONDS WAY, #113 EDMONDS, WA 98020
STRUCTURAL ENGINEER:	DENNIS TITUS CG ENGINEERS 250 4TH AVE S, SUITE 200 EDMONDS, WA, 98020 425-778-8500
PROJECT DESCRIPTION:	NEW CUSTOM SINGLE FAMILY RESIDENCE
PROJECT ADDRESS:	6716 AND 6712 168TH AVE SE
TAX LOT NUMBER:	2524059166 AND 2524059157
LEGAL DESCRIPTION:	P'CL "A" OF BELLEVUE BLA #18- 116093 LW REC # 20190221902002 SD BLA LOC IN NW 1/4 OF NW 1/4 OF SE 1/4 OF NW 1/4 STR 25-24-05 P'CL "B" OF BELLEVUE BLA #18- 116093 LW REC # 20190221902002 SD BLA LOC IN NW 1/4 OF NW 1/4 OF SE 1/4 OF NW 1/4 STR 25-24-05

LAND USE CODE COMPLIANCE STATISTICS

ZONE:	R-1.8 STEEP SLOPE; INFILTRATION INFEASIBILITY	
REQD SETBACKS:	FRONT: REAR SETBACK: SIDE SETBACK:	30' 25' 5' MIN; COMBINED WIDTH 15'
PARKING:	2 PARKING SPACES REQUIRED	
BUILDING HEIGHT INFORMATION:	BUILDING HEIGHT LIMIT = 30', 35' REFER TO SHEET A2.0 AND A2.1 FOR DETAILED HEIGHT INFORMATION	

*REFER TO 02 SHEET FOR ALL OTHER LAND USE CODE COMPLIANCE STATISTICS

SHEET INDEX

FEDERMAN RESIDENCE
6716 AND 6712 168TH AVE SE
BELLEVUE WA 98006

PRELIMINARY NOT FOR CONSTRUCTION

H 2 D
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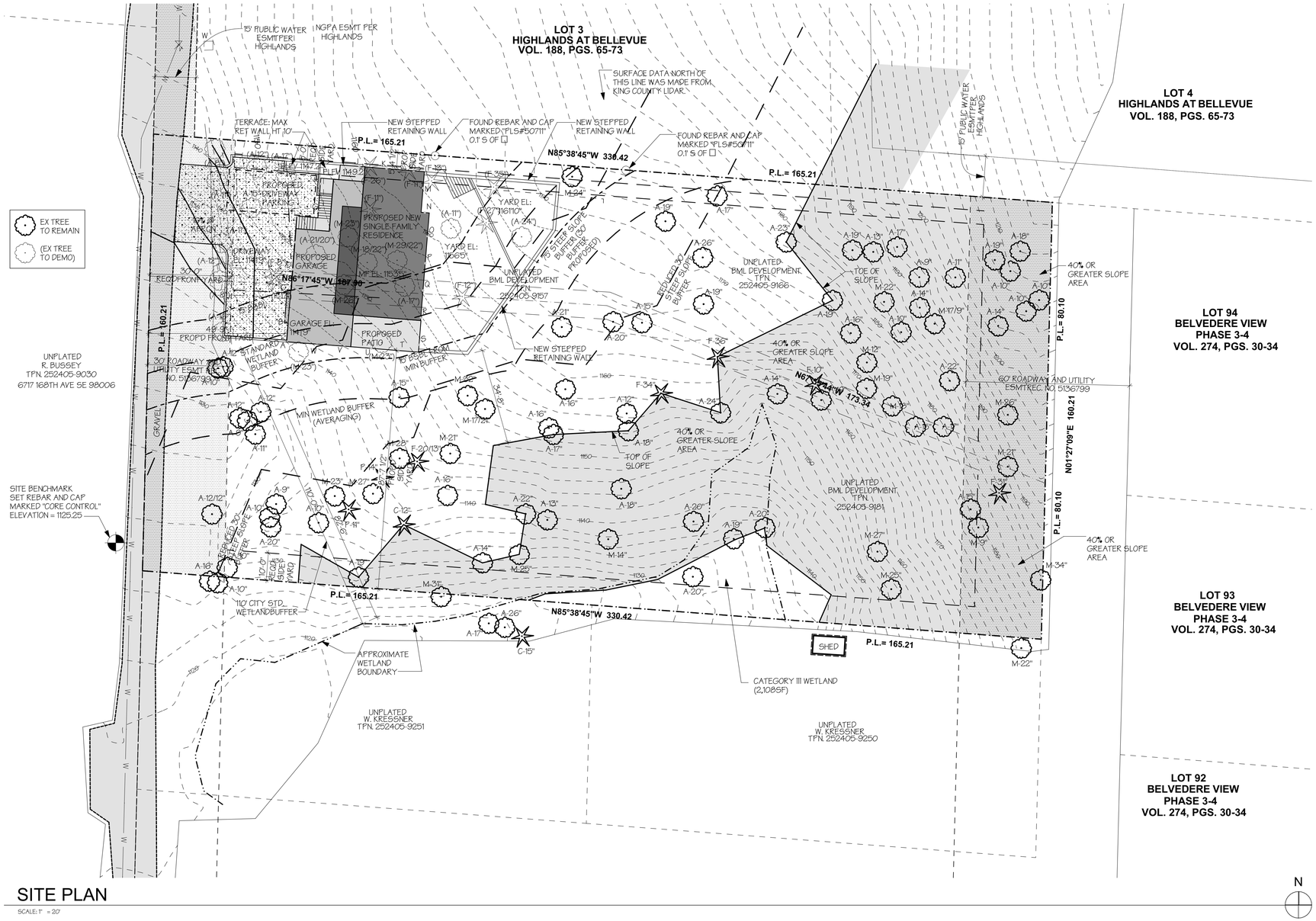
www.h2darchitects.com

DATE: 10/20/2021

CRITICAL AREA LAND USE PERMIT

PROJECT INFORMATION, VICINITY MAP, GENERAL NOTES, AS-BUILT PLANS



SITE PLAN

SCALE: 1" = 20'

LAND USE CODE COMPLIANCE STATISTICS

ZONE:	R-1.8 STEEP SLOPE; INFILTRATION INFEASIBILITY	
LOT COVERAGE:	LOT AREA: (MINUS STEEP SLOPE AREA): TOTAL NET LOT AREA:	52,867.6 SF (VERIFY W/ SURVEY) (-23,756.6 SF) 29,111 SF
	NEW HOUSE: PROPOSED LOT COVERAGE: ALLOWED LOT COVERAGE:	2,984 SF 2,984 SF 29,111 SF X 35% = 10,188.8 SF...OK
REQ'D SETBACKS:	FRONT: REAR SETBACK: SIDE SETBACK:	30' 25' 5' MIN; COMBINED WIDTH 15'
PARKING:	2 PARKING SPACES REQUIRED	
BUILDING HEIGHT INFORMATION:	BUILDING HEIGHT LIMIT = 30', 35' REFER TO SHEET A2.0 AND A2.1 FOR DETAILED HEIGHT INFORMATION	
IMPERVIOUS SURFACE:	PROPOSED IMP. SURFACE: ALLOWED IMP. SURFACE: *INCLUDES STREET, DRIVEWAY, HOUSE/ROOF, RETAINING WALLS, EXTERIOR STAIRS	6107.7 SF 52,867.6 SF X 45% = 23,790.4 SF
F.A.R.:	PROPOSED F.A.R. ALLOWED F.A.R.	4325.1 SF 52,867.6 SF X 50% = 26,433.8 SF

AVERAGE EXISTING GRADE	
POINT	ELEVATION
A	1140.0'
B	1141.7'
C	1141.7'
D	1141.7'
E	1141.7'
F	1141.7'
G	1141.7'
H	1149.2'
I	1149.2'
J	1158.2'
K	1161.5'
L	1163'
M	1156.4'
N	1156.4'
O	1156.4'
P	1156.4'
Q	1156.4'
R	1156.4'
S	1156.4'
T	1148.2'
U	1145.8'
V	1144'
W	1142.2'
26446.3/23= 1149.8' = 1149'-10" (ROUND TO NEAREST INCH)	
AVERAGE GRADE =1149'-10"	
30' HEIGHT LIMIT = 1179'-10"; 35' HEIGHT LIMIT = 1184'-10"	

FEDERMAN RESIDENCE

6716 AND 6712 168TH AVE SE
BELLEVUE WA 98006

PRELIMINARY NOT FOR CONSTRUCTION

H 2 D
ARCHITECTURE
+
D E S I G N

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DATE: 10/20/2021

CRITICAL AREA LAND USE PERMIT

SITE PLAN

02

BASIS OF BEARINGS

WASHINGTON COORDINATE SYSTEM NAD83(2011)–NORTH ZONE
N32°47'20"W BETWEEN THE FOUND MONUMENTS IN THE CENTERLINE OF SE 69TH WAY.

REFERENCES

1. COUGAR RIDGE EAST RECORDED IN VOLUME 206 OF PLATS AT PAGES 90–96, RECORDS OF KING COUNTY WASHINGTON. (USED FOR SECTION SUBDIVISION)

LEGAL DESCRIPTION

PARCEL A:
THE NORTH 160 FEET OF THE WEST 165 FEET OF THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON;
(BEING KNOWN AS LOTS 1 AND 2, BLOCK 2, COUGAR RIDGE, ACCORDING TO THE UNRECORDED PLAT THEREOF.)

PARCEL B:
THE SOUTH 80 FEET OF THE NORTH 160 FEET OF THE EAST 165 FEET OF THE WEST 330 FEET OF THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON;
(BEING KNOWN AS LOT 33, BLOCK 2, COUGAR RIDGE, ACCORDING TO THE UNRECORDED PLAT THEREOF.)

PARCEL C:
THE NORTH 80 FEET OF THE EAST 165 FEET OF THE WEST 330 FEET OF THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON;
(BEING KNOWN AS LOT 34, BLOCK 2, COUGAR RIDGE, RECORDED)

RESTRICTIONS

1. THIS SITE IS SUBJECT TO THE RESERVATIONS AND EXCEPTIONS, INCLUDING THE TERMS AND CONDITIONS THEREOF RESERVING MINERALS AS DISCLOSED BY INSTRUMENTS RECORDED UNDER RECORDING NUMBERS 4608780 AND 4609186. (NOTED HERE)

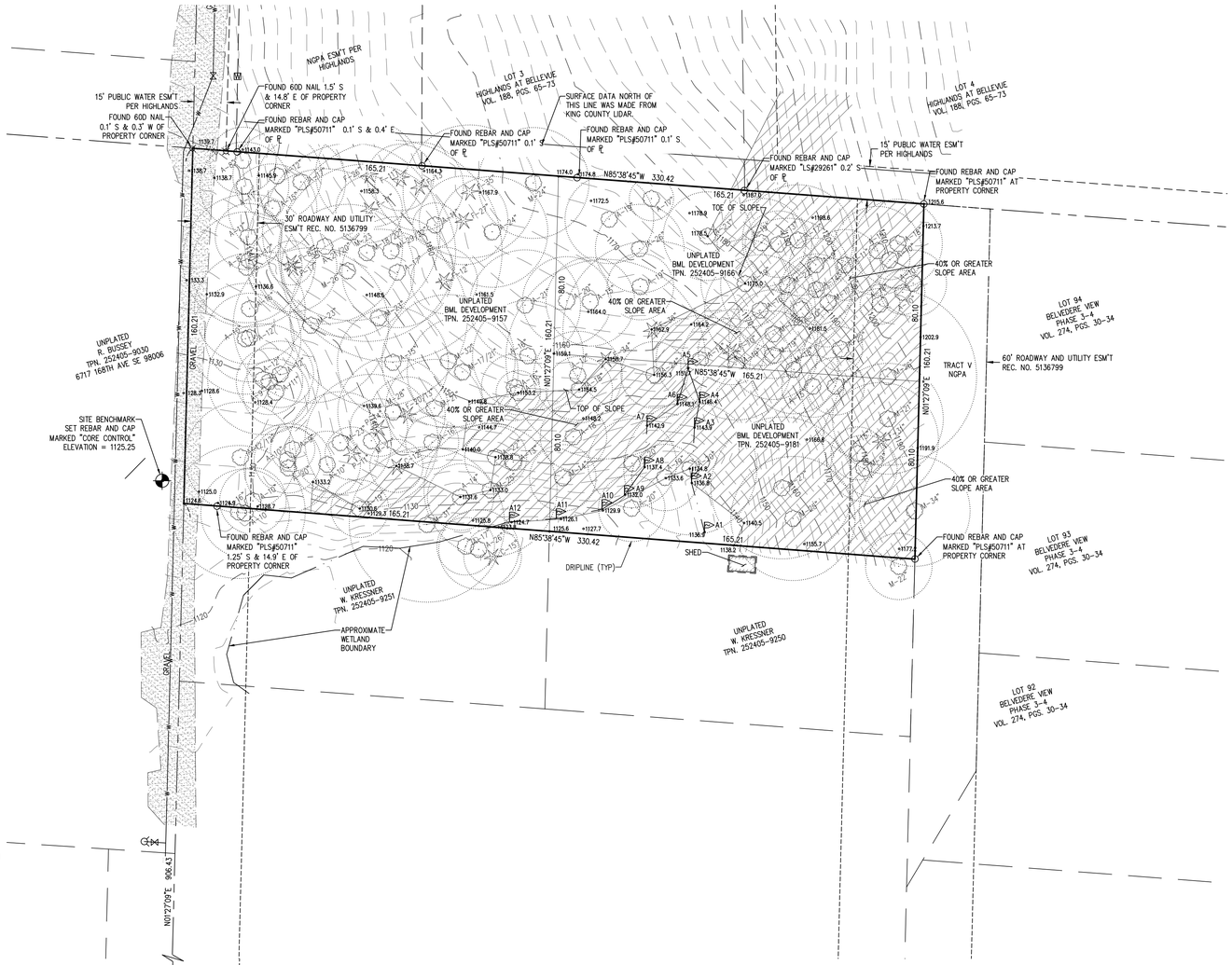
2. THIS SITE IS SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS AND/OR EASEMENTS AS DISCLOSED BY INSTRUMENT RECORDED UNDER RECORDING NUMBER 5110802. (NOTED HERE, CONTAINS RESTRICTIVE COVENANTS)

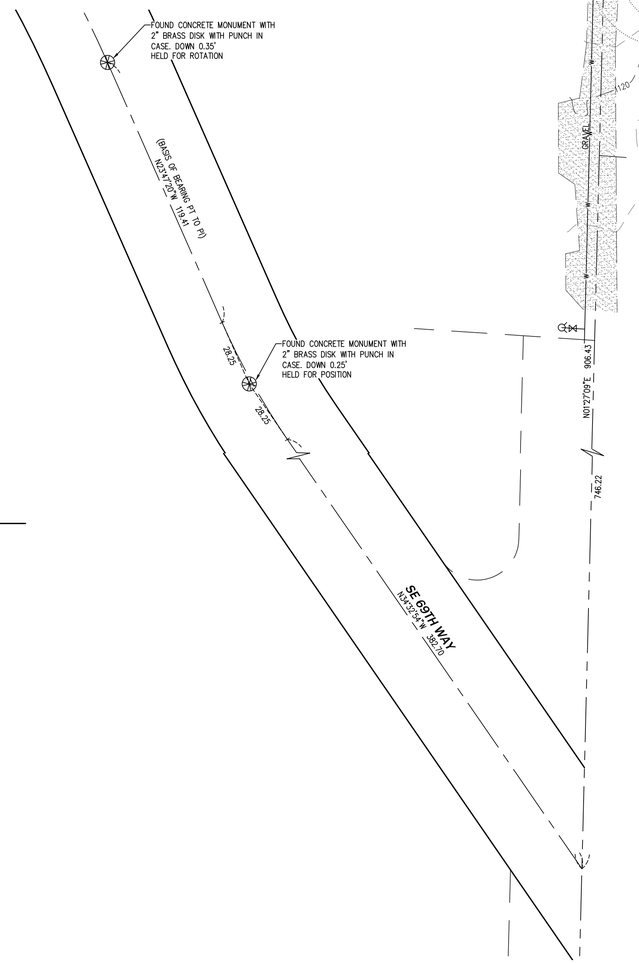
3. THIS SITE IS SUBJECT TO THE TERMS AND PROVISIONS OF AN EASEMENT FOR ROADWAY AND UTILITIES AS DISCLOSED BY INSTRUMENT RECORDED UNDER RECORDING NUMBER 5136799. (SHOWN HEREON)

4. THIS SITE IS SUBJECT TO THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLES "CONTRACT REIMBURSEMENT UNDER MUNICIPAL WATER AD SEWER FACILITIES ACT" AS DISCLOSED BY INSTRUMENT RECORDED UNDER RECORDING NUMBER 20021115000954. (NOTED HERE)

5. THIS SITE IS SUBJECT TO THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "SEWER LATECOMER AGREEMENT" AS DISCLOSED BY INSTRUMENT RECORDED UNDER RECORDING NUMBER 20071212000556. (NOTED HERE)

6. THIS SITE IS SUBJECT TO CONDITIONS, NOTES, EASEMENTS, PROVISIONS AND/OR ENCROACHMENTS CONTAINED OR DELINEATED ON THE FACE OF THE SURVEY RECORDED UNDER RECORDING NUMBER 20141124900008. (NOTED HERE)





LEGEND

- FOUND MONUMENT, AS NOTED
- FOUND PROPERTY CORNER, AS NOTED
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- WETLAND FLAG, AS NOTED
- EVERGREEN TREE, AS NOTED
- DECIDUOUS TREE, AS NOTED
- F FIR TREE
- P PINE TREE
- C CEDAR TREE
- M MAPLE TREE
- A ALDER TREE

N

SCALE: 1" = 30'
0 15 30 60

VERTICAL DATUM

NAVD 88

ORIGINAL BENCHMARK

CITY OF BELLEVUE VERTICAL ID NUMBER 824.
2" BRASS CAP STAMPED "H3071 AND V824 WITH PUNCH.
LOCATED 50' SOUTH OF THE INTERSECTION OF 166TH WAY SE AND SE 73RD STREET.
ELEVATION: 1079.84

SITE BENCHMARK

SET REBAR AND CAP MARKED "CORE CONTROL" IN THE SOUTHWEST CORNER OF THE SITE.

ELEVATION = 1125.25

NOTES

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NO.	REVISIONS	DATE

DAVID R. BROOKS — 20183 — REGISTERED PROFESSIONAL LAND SURVEYOR — STATE OF WASHINGTON
05-22-18

CORE DESIGN
ENGINEERING • PLANNING • SURVEYING
14711 NE 29th Place, #101
Bellevue, Washington 98007
425.885.7877 Fax 425.885.7963

BOUNDARY/TOPOGRAPHIC PROPERTIES
COUGAR MOUNTAIN PARCELS

MS. BETTY TONG
PO BOX 609
MERCER ISLAND, WA 98039

DATE	2018-05-22
DESIGNED	
DRAWN	JJR
APPROVED	RDW
	GINA R. BROOKS, PE PROJECT MANAGER
SHEET	1
OF	1
PROJECT NUMBER	17146

BASIS OF BEARINGS

WASHINGTON COORDINATE SYSTEM NAD83(2011)–NORTH ZONE
N32°47'20"W BETWEEN THE FOUND MONUMENTS IN THE CENTERLINE OF SE 69TH WAY.

REFERENCES

1. COUGAR RIDGE EAST RECORDED IN VOLUME 206 OF PLATS AT PAGES 90–96, RECORDS OF KING COUNTY WASHINGTON. (USED FOR SECTION SUBDIVISION)

LEGAL DESCRIPTION

PARCEL A:
THE NORTH 160 FEET OF THE WEST 165 FEET OF THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON;
(BEING KNOWN AS LOTS 1 AND 2, BLOCK 2, COUGAR RIDGE, ACCORDING TO THE UNRECORDED PLAT THEREOF.)

PARCEL B:
THE SOUTH 80 FEET OF THE NORTH 160 FEET OF THE EAST 165 FEET OF THE WEST 330 FEET OF THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON;
(BEING KNOWN AS LOT 33, BLOCK 2, COUGAR RIDGE, ACCORDING TO THE UNRECORDED PLAT THEREOF.)

PARCEL C:
THE NORTH 80 FEET OF THE EAST 165 FEET OF THE WEST 330 FEET OF THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON;
(BEING KNOWN AS LOT 34, BLOCK 2, COUGAR RIDGE, RECORDED)

RESTRICTIONS

1. THIS SITE IS SUBJECT TO THE RESERVATIONS AND EXCEPTIONS, INCLUDING THE TERMS AND CONDITIONS THEREOF RESERVING MINERALS AS DISCLOSED BY INSTRUMENTS RECORDED UNDER RECORDING NUMBERS 4608780 AND 4609186. (NOTED HERE)

2. THIS SITE IS SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS AND/OR EASEMENTS AS DISCLOSED BY INSTRUMENT RECORDED UNDER RECORDING NUMBER 5110802. (NOTED HERE, CONTAINS RESTRICTIVE COVENANTS)

3. THIS SITE IS SUBJECT TO THE TERMS AND PROVISIONS OF AN EASEMENT FOR ROADWAY AND UTILITIES AS DISCLOSED BY INSTRUMENT RECORDED UNDER RECORDING NUMBER 5136799. (SHOWN HEREON)

4. THIS SITE IS SUBJECT TO THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLES "CONTRACT REIMBURSEMENT UNDER MUNICIPAL WATER AD SEWER FACILITIES ACT" AS DISCLOSED BY INSTRUMENT RECORDED UNDER RECORDING NUMBER 20021115000954. (NOTED HERE)

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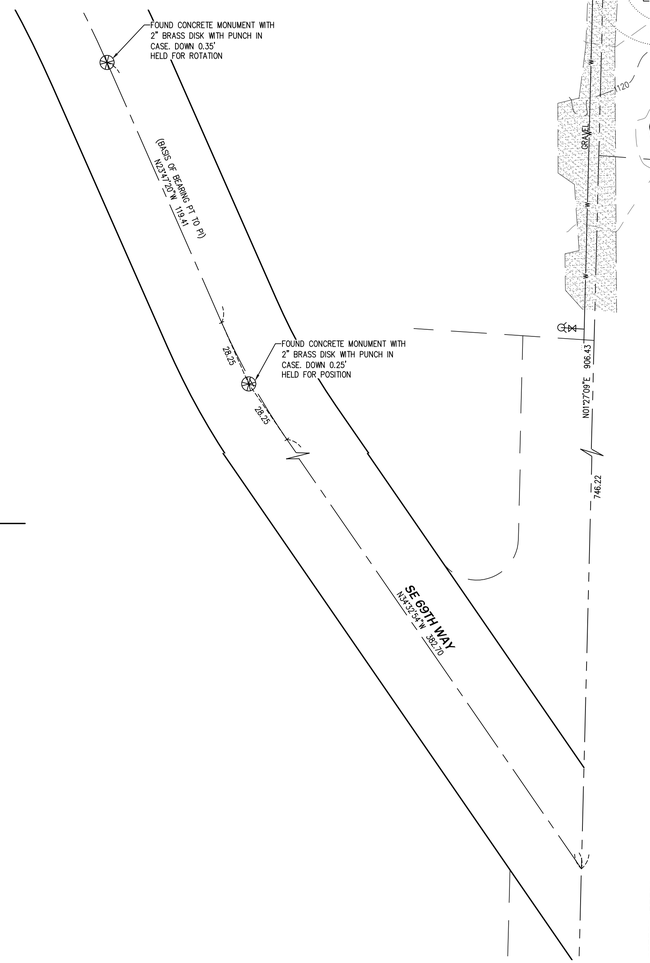

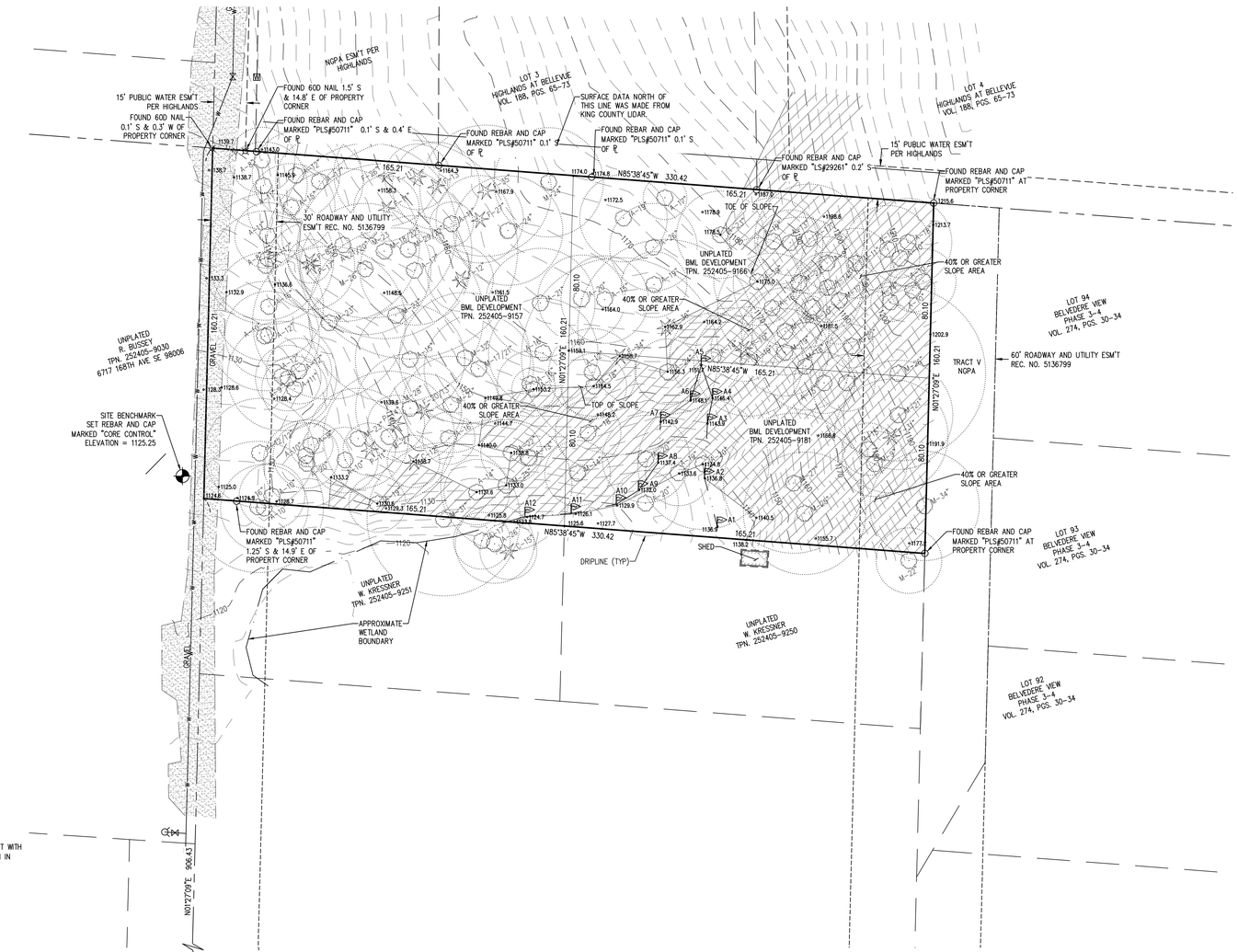

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REGISTERED PROFESSIONAL LAND SURVEYOR — DAVID R. BROOKS — 20183 — STATE OF WASHINGTON — 05-22-18

CORE DESIGN
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DATE 2018-05-22
DESIGNED
DRAWN JJR
APPROVED RDW
GINA R. BROOKS, PE
PROJECT MANAGER

SHEET 1 OF 1

PROJECT NUMBER 17146

CRITICAL AREAS REPORT & BUFFER MITIGATION PLAN

FOR

6712 & 6716 168TH AVENUE SE

Wetland Resources, Inc. Project #21147

Prepared By
Wetland Resources, Inc.
9505 19th Avenue SE, Suite 106
Everett, WA 98208
(425) 337-3174

Prepared For
David and Maria Federman
5508 NE 7th Place
Renton, WA 98059

October 27, 2021

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LIST OF APPENDICES

1.0 INTRODUCTION

Wetland Resources, Inc. (WRI) performed a site investigation on May 10, 2021, to identify and evaluate wetlands, streams, and wildlife habitat at the property located at 6712 and 6716 168th Avenue SE in Bellevue. The site consists of two parcels (King County tax ID 2524059157 and 2524059166). The 1.21-acre site is further identified under the Public Land Survey System (PLSS) as a portion of Section 25, Township 24N, Range 05E, W.M. It is located in the Coal Creek drainage basin within the Cedar River/Lake Washington watershed, Water Resources Inventory Area (WRIA) 8.

A wetland delineation was conducted on the property in September 2017 (*Wetland Assessment* of *the Vacant Tac Parcels Nos. 252405-9157, 252405-9166, & 252405-9181,* prepared by Jeffery S. Jones, dated October 6, 2017; Appendix A). One wetland was identified in the southern portion of the property. The 2017 wetland assessment was reviewed by the City of Bellevue and approved under permit file number 18-115602-LO. During the May 2021 site investigation by WRI, new wetland delineation flags were placed. The wetland boundary does not appear to have changed and WRI concurs with the wetland boundary as mapped by J.S. Jones. The previously approved wetland assessment was conducted prior to a change in the Bellevue Land Use Code (May 2018). Therefore, WRI re-evaluated the wetland classification and buffer requirements under the current code ordinance.

A geotechnical study was conducted by Geotech Consultants, Inc. to identify and evaluate geological hazard areas on the site. The *Geotechnical Engineering Study* (dated September 7, 2021), henceforth referred to as the geotechnical report, contains an analysis of geological hazard areas, potential impacts, and construction recommendations as well as compliance with Bellevue Land Use Code (LUC) as it applies. The geotechnical report is included in Appendix A.

The purpose of this report is to provide information on existing conditions of the site as required when a project is requesting a modification of critical areas, buffers, or setbacks. This report documents presence of critical areas on the site and on all properties immediately adjacent and includes a mitigation plan to compensate for impacts to the wetland buffer associated with the proposed development.

1.1 SITE DESCRIPTION

Access to the site is from the west via 168th Avenue SE. The property is forested with no existing development. Dominant vegetation includes big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), western red cedar (*Thuja plicata*), osoberry (*Oemleria cerasiformis*), salmonberry (*Rubus spectabilis*), swordfern (*Polystichum munitum*), and lady fern (*Athyrium cyclosorum*). Topography of the site slopes steeply to the south and southwest.

One wetland (Wetland A) was identified in the southern portion of the property. Per Bellevue Land Use Code (LUC 20.25H.095(C), WRI assessed Wetland A under the Wetland Rating System for Western Washington (Hruby 2014). It is classified as a Category III wetland with a habitat score of 7 and receives a 110-foot standard protective buffer.

Figure 1 - Aerial photo of the subject property (not to scale)

2.0 REVIEW OF EXISTING INFORMATION

Prior to conducting an on-site investigation of the project area, public resource information was reviewed to identify the presence of wetlands, streams, and other critical areas within and near the project area. The following information was examined:

- *USDA/NRCS Web Soil Survey*: The Web Soil Survey shows the soils on-site are Beausite gravelly sandy loam, 15 to 30 percent slopes.
- *USFWS National Wetlands Inventory (NWI)*: NWI does not depict any features on the site or on any adjacent properties.
- *Washington State DNR Forest Practices Application Mapping Tool (FPAMT)*: FPAMT does not depict any features on or adjacent to the site.
- *WDFW SalmonScape Interactive Map*: The SalmonScape map does not identify presence of salmonid species on or near the project site.
- *WDFW Priority Habitat and Species (PHS) Interactive Map*: PHS does not depict any features on or in the vicinity of the site.
- *King County iMap*: The King County iMap online mapping tool shows a stream located along the southern property boundary.
- *Bellevue Geologic Hazards Map:* Areas with steep slopes greater than 40 percent are mapped on the property. The site is also mapped within a very severe soil erosion hazard area.

- *Bellevue Map Viewer*: The Bellevue Map Viewer online mapping tool depicts steep slopes in portions of the property and maps the property within an infiltration infeasible area.

3.0 CRITICAL AREAS DETERMINATION

3.1 WETLAND DETERMINATION

3.1.1 Methodology

Wetland conditions were evaluated using routine methodology described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). Under the routine methodology, the process for making a wetland determination is based on three steps:

1.) Examination of the site for hydrophytic vegetation (species present and percent cover);

2.) Examination of the site for hydric soils;

3.) Determining the presence of wetland hydrology

Hydrophytic Vegetation Criteria

The manuals define hydrophytic vegetation as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. One of the most common indicators for hydrophytic vegetation is when more than 50 percent of a plant community consists of species rated "Facultative" and wetter on lists of plant species that occur in wetlands.

Soils Criteria and Mapped Description

The manuals define hydric soils as those that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Field indicators are used for determining whether a given soil meets the definition for hydric soils.

According to the NRCS Web Soil Survey, soils on-site are Beausite gravelly sandy loam, 15 to 30 percent slopes. This soil is described as well drained. It contains inclusions of Norma (3 percent) and Seattle (2 percent), which are hydric soil types typically found in depressions.

Hydrology Criteria

The 2010 Regional Supplement defines wetland hydrology as "areas that are inundated (flooded or ponded) or the water table is less than or equal to 12 inches below the soil surface for 14 or more consecutive days during the growing season at a minimum frequency of 5 years in 10." During the early growing season, wetland hydrology determinations are made based on physical observation of surface water, a high water table, or saturation in the upper 12 inches. Outside of the early growing season, wetland hydrology determinations are made based on physical evidence of recent inundation or saturation (i.e. water marks, surface soil cracks, water-stained leaves).

Per Bellevue Land Use Code (LUC 20.25H.095(C)), wetlands are classified using the Washington State Wetland Rating System for Western Washington (Washington State Department of Ecology Publication Number 14-06-029, as amended).

3.1.2 Wetland Determination Results

One wetland (Wetland A) was identified in the southern portion of the site.

Wetland A
Rating HGM Class: Depressional
Cowardin Class: Palustrine, Forested Wetland, Broad-Leaved deciduous, Permanently Flooded
Department of Ecology Rating Score: 19
Department of Ecology Rating Category: Category III
Habitat Score: 7
Bellevue Buffer Width: 110 feet

Wetland A is a slope and depressional wetland that extends onto the property from the south. The northernmost portion of the wetland lies within a ravine on the subject property. It extends to the south and west to a depressional area that includes an area that appears to be permanently ponded. Hydrology from Wetland A outlets to a narrow ditch along 168th Avenue SE. The ditch flows south along the east side of 168th Avenue SE for approximately 130 feet where it enters a culvert directing it to the west under the road, where it flows into a ravine. The stream continues to the west

Under the Wetland Rating System for Western Washington (Hruby 2014), wetlands with slope and depressional hydrogeomorphic classes are rated using the Depressional rating form.

The on-site portion of the wetland is 2,125 square feet. It extends off site to the south. The wetland is forested with a canopy that is dominated by western red cedar (*Thuja plicata;* FAC) and red alder (*Alnus rubra*; FAC). The understory includes salmonberry (*Rubus spectabilis*; FAC), piggyback plant (*Tolmiea menziesii*; FAC), lady fern (*Athyrium cyclosorum*; FAC), and trailing blackberry (*Rubus ursinus*; FACU). Dominant vegetation in Wetland A is rated as FAC or wetter, indicating that it is a hydrophytic plant community.

The soils in the wetland are black (10YR 2/1) sandy loam in the upper 10 inches. From 10 to 16 inches depth soils are black (10YR 2/1) sandy loam with 2 percent dark yellowish brown (10YR 3/4) redoximorphic features and 2 percent dark gray (5YR 4/1) depletions. Although this soil profile does not meet a standard hydric soil indicator, it is our professional opinion based on hydrology, vegetation, and low chroma soils with depletions that the soils in the area mapped as Wetland A are saturated or inundated long enough during the growing season to develop anaerobic conditions in the upper portion of the soil profile.

At the time of our site investigation, saturation was to the surface and a high water table was present at 8 inches deep. These conditions meet wetland hydrology indicators (A2) High Water Table and (A3) Saturation.

Wetland A receives a total of 19 points on the wetland rating form (6 points for water quality improvement, 6 points for hydrologic function, and 7 points for wildlife habitat function). This

results in a Category III classification. Pursuant to Bellevue LUC 20.25H.095, Category III wetlands with habitat scores between 5 and 7 receive 110-foot standard protective buffers on undeveloped sites.

3.2 STREAM DETERMINATION

3.2.1 Stream Determination Methodology

The ordinary high water mark (OHWM) of streams and waterbodies were identified using the methodology described in: the Washington State Department of Ecology document *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016). Streams are classified pursuant to Bellevue LUC 20.25H.075.

3.2.2 Stream Determination Results

One stream was identified to the south of the subject site. Wetland A outlets to Stream A.

Stream A
Bellevue Stream Classification: Type N
Bellevue Buffer Width: 50 feet

As described above, one stream (Stream A) was observed to the south of the subject site. Wetland A outlets to a narrow ditch south of the subject property. The ditch flows south along 168th Avenue SE, passes through a culvert under the road and continues west in an open channel through a ravine. This stream continues in a westerly direction, passing through additional culverts, until it ultimately flows into Coal Creek.

The portion of Stream A in the vicinity of the subject site is a roadside ditch that is less than two feet wide and is classified as a Type N stream. Pursuant to LUC 20.25H.075(C)(1), Type N streams on undeveloped sites receive 50-foot protective buffers.

3.3 HABITAT ASSESSMENT

Habitat associated with species of local importance listed in LUC 20.25H.165.A is designated as critical area under LUC 20.25H.150.B. Therefore, WRI performed an assessment of the property to determine the likelihood of use by these species.

3.3.1 Vegetation Description

The subject property is undeveloped and forested. Canopy vegetation includes red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*). The understory includes salmonberry (*Rubus spectabilis*), osoberry (*Oemleria ceraciformis*), swordfern (*Polystichum munitum*), piggyback-plant (*Tolmiea menziesii*), and trailing blackberry (*Rubus ursinus*). During the site investigation multiple large snags were observed and had signs of excavation by Pileated Woodpecker (*Dryocopus pileatus*) and other woodpecker species.

3.3.2 Observed Wildlife and Sign

During our site investigation, multiple bird species were observed on-site. These birds included: Common Raven (*Corvus corax*), Pileated Woodpecker (*Dryocopus pileatus*), Northern Flicker (*Colaptes auratus),* Red-breasted Sapsucker (*Sphyrapicus ruber*), American Robin (*Turdis migratorius*), Spotted Towhee (*Pipilo maculatus*), Dark-eyed Junco (*Junco hyemalis*), Song Sparrow (*Melospiza melodia*), Red-breasted Nuthatch (*Sitta canadensis*), Black-headed Grosbeak (*Pheucticus melanocephalus*), Brown Creeper (*Certhia americana),* Pacific Wren (*Troglodytes pacificus*), Golden-crowned Kinglet (*Regulus satrapa*), Wilson's Warbler (*Cardellina pusilla*), Anna's Hummingbird (*Calypte anna*), and Rufous Hummingbird (*Selasphorus rufus)*.

Mammalian wildlife sign included Columbian black-tailed deer (*Odocoileus hemionus columbianus*) scat and tracks, and black bear (*Ursus americanus*) claw marks. A deer mouse (*Peromyscus maniculatus*) was also observed on-site. One large squirrel nest was observed.

3.3.3 Predicted Wildlife Use

Mammalian species that may also utilize this site include bobcat (*Lynx rufus*), coyote (*Canis latrans*), Virginia opossums (*Didelphis virginiana*), eastern cottontail rabbits (*Sylvilagus floridanus*), weasels (*Mustela sp.*), raccoons (*Procyon lotor*), skunks (*Mephitis* spp.), squirrels (*Sciurus spp.*), voles (*Microtus arvalis*), and shrews (*Sorex* spp.).

Other wildlife expected to use this site include: pacific tree frog (*Hyla regilla*), northwestern salamander (*Ambystoma gracile*), Ensatina salamander (*Ensatina eschscholtzii*), western redback salamander (*Plethodon vehiculum)*, and rough-skinned newt (*Taricha granulosa*).

No priority species or habitats are identified by the WDFW PHS online mapping application, or any other commonly available public resource, as being present on the subject property.

These lists are not intended to be all-inclusive, and may omit species that currently utilize or could utilize the site. The subject property is located within the vicinity of the Cougar Mountain Regional Wildland Park, but the site is isolated by dense suburban residential development surrounding it, limiting its use by wildlife and as a wildlife corridor.

3.3.4 Species of Local Importance

During the site investigation a Pileated woodpecker was both seen and heard on the site. Multiple large snags also exhibited signs of Pileated woodpecker feeding excavations. Pileated woodpeckers are a species of local importance in the City of Bellevue per LUC 20.25H.150. No other priority species or habitats were observed on site. Further, no other species of local importance are predicted on site.

3.3.5 Potential Habitat Impact

Work is proposed within the northwest corner of the subject property. The existing snags that exhibited use by Pileated Woodpecker are within the steep slope and buffer areas. These snags will not be removed as part of the proposed development and will be within areas that will be protected in perpetuity.

3.4 GEOLOGIC HAZARD AREAS

Geologic hazard areas on the site were evaluated by Geotech Consultants, Inc. and are described in detail in the geotechnical report (Appendix A). One steep slope area, which also meets the definition of a landslide hazard area, occurs on the subject site. The geotechnical report concludes that a minimum total buffer of 30 feet must be maintained from the top of the steep slope, as measured from the edge of the development area, including the patio extending off the southern side of the residence.

The geotechnical report provides recommendations for design and implementation of the proposed development to mitigate any risks associated with the geologic hazards identified on the site. Additionally, the geotechnical report addresses criteria under the City of Bellevue Land Use Code (LUC), section 20.25H, that pertain to geologic hazard areas as they apply to this project.

3.5 FREQUENTLY FLOODED AREAS

No frequently flooded areas are mapped or were identified on or near the subject property.

4.0 PROJECT DESCRIPTION

The applicants propose to combine the two existing parcels into one parcel and construct one single-family residence (SFR) with attached garage, access drive, and parking in the northwestern corner of the site. No direct critical area impacts will occur. The proposed development plan requires 2,572 square feet of impact to the wetland buffer. Impacts have been minimized by making several modifications to the original site plan. The orientation of the house has been shifted with a portion of the house located over the garage. The driveway and parking area has been shifted and reduced in size, and the size of the yard has been reduced. The development proposal results in significantly less impact to the wetland buffer than would be necessary if the lots were developed separately with two SFRs and has been minimized to the extent possible.

To compensate for the proposed buffer impact, 5,600 square feet of buffer enhancement is proposed. The enhancement plan includes removal of invasive species and interplanting native conifers and shrubs among existing native vegetation.

Per LUC 20.25H.230,

"The critical areas report is intended to provide flexibility for sites where the expected critical area functions and values are not present due to degraded conditions or other unique site characteristics, or for proposals providing unique design or protection of critical area functions and values not anticipated by this part. The scope and complexity of information required in a critical areas report will vary, depending on the scope and complexity and magnitude of impact on critical areas and critical area buffers associated with the proposed development. Generally, the critical areas report must demonstrate that the proposal with the requested modifications leads to equivalent or better protection of critical area functions and values than would result from the application of the standard requirements. Where the proposal involves restoration of degraded conditions in exchange for a reduction in regulated critical area buffer on a site, the critical areas report must demonstrate a net increase in certain critical area functions."

The consolidation of the two existing parcels and development of one SFR represents a unique design that reduces the amount of critical area impacts to the site as compared with what would be required to develop both parcels. The project as designed will result in greater protection of critical areas than could be achieved if both parcels are developed. Further, the proposed plan includes enhancement of buffer vegetation between the development and the wetland and steep slope, which will improve buffer functions and values.

No direct impacts to critical areas are proposed and functions of the on-site critical areas will not be diminished. Functions provided by wetland buffers include water quality improvement (removing sediment, excess nutrients, and toxics) and wildlife habitat function and connectivity (Sheldon, et. al. 2005). Vegetation in the buffer enhancement area consists primarily of sparsely distributed red alder and big-leaf maple in the canopy with a minimal understory vegetation. Snags and logs are present, which provide important wildlife habitat and will be retained.

Figure 2 -Sparse understory in the buffer enhancement area. Large woody debris and snags will be retained.

Any invasive species within the buffer enhancement area will be removed and native conifers and shrubs will be interspersed among existing native vegetation to improve buffer functions and values. Increasing the vegetation density in the wetland buffer will increase the capacity of the buffer to improve water quality by slowing and filtering surface water. Dense vegetation intercepts rainfall, reducing the amount and velocity of surface water flows and reducing soil erosion. For example, conifers can hold up to fifty percent of rainfall during a storm, of which twenty to thirty percent may never reach the ground but is taken up by the tree or evaporates (Washington Department of Ecology 2014). The proposed buffer enhancement, which will add native conifers and shrubs, will increase vegetation density thereby improving the hydrologic functions of the on-site buffer. The increased vegetation density will also improve noise and visual screening between the wetland and the development and will provide thermal and hiding cover. Additionally, the enhancement plantings will result in an increase in native forage resources and perching and nesting opportunities, which will benefit wildlife. The additional trees will also provide an increase in future large, woody debris and other organic matter recruitment. These improvements will compensate for the proposed reduction in the width of the buffer and will result in better protection of critical area functions and values as compared with that which would result from application of the standard requirements.

5.0 CRITICAL AREA REPORT – DECISION CRITERIA

Text in italics below is from LUC 20.45H.255, with WRI responses in plain text.

A. General

Except for the proposal described in subsection B of this section, the Director may approve, or approve with modifications, the proposed modification where the applicant demonstrates:

1. *The modifications and performance standards included in the proposal lead to levels of protection of critical area functions and values at least as protective as application of the regulations and standards of this code;*

By combining the parcels into one, thus reducing the development on the site from two homes to one, and with the mitigation measures proposed, the project will result in a net improvement in critical area functions on the site than could be achieved under the standard code requirements.

2. *Adequate resources to ensure completion of any required mitigation and monitoring efforts;*

The applicant will provide a surety at the time of the building permit application submittal.

3. *The modifications and performance standards included in the proposal are not detrimental to the functions and values of critical areas and critical area buffers off-site; and*

The project will not result in any adverse impacts to critical area or buffer functions off site.

4. *The resulting development is compatible with other uses and development in the same land use district.*

The subject site is in single-family residential neighborhood. The proposed development is a single-family home, which is compatible with the land use district.

B. Decision Criteria – Proposals to Reduce Regulated Critical Area Buffer.

The Director may approve, or approve with modifications, a proposal to reduce the regulated critical area buffer on a site where the applicant demonstrates:

1. *The proposal includes plans for restoration of degraded critical area or critical area buffer functions which demonstrate a net gain in overall critical area or critical area buffer functions;*

The applicant proposes to consolidate two parcels into one and to construct a single-family residence in the northwest corner of the site. The proposed development requires a reduction in a portion of the wetland buffer. To compensate for the proposed buffer reduction (2,572 square feet), the applicant proposes to enhance the buffer between the development and the steep slope and wetland (5,600 square feet). The buffer enhancement area consists primarily of red alder and big leaf maple with a sparse understory. Any invasive species will be removed from the buffer enhancement area. Native conifers and shrubs will be interspersed among existing native

vegetation (which will be retained) to improve buffer functions and values. Overall, the proposed plan results in a net gain in critical area buffer functions.

2. *The proposal includes plans for restoration of degraded critical area or critical area buffer functions which demonstrate a net gain in the most important critical area or critical area buffer functions to the ecosystem in which they exist;*

The proposed buffer enhancement will improve water quality function by increasing vegetation density in the understory, which will intercept rainwater, stabilize soils on the slope, and increase filtration of surface water flows. Additionally, the additional coniferous tree cover and shrub cover will increase the interception of rainwater, which improves the hydrologic functions of the buffer. Finally, the buffer enhancement will improve noise and visual screening, increase thermal and hiding cover, increase forage resources, all of which benefit wildlife utilizing the site.

3. *The proposal includes a net gain in stormwater quality function by the critical area buffer or by elements of the development proposal outside of the reduced regulated critical area buffer;*

The proposed buffer enhancement will improve stormwater quality function. The existing vegetation in the buffer between the proposed house and the wetland consists primarily of deciduous trees (red alder and big-leaf maple) with a sparse understory. Deciduous trees lack foliage throughout most of the rainy season in western Washington and intercept less rainwater than conifers, which keep their foliage throughout the year. Conifers can hold up to fifty percent of rainfall during a storm, of which twenty to thirty percent may never reach the ground but is taken up by the tree or evaporates (Washington Department of Ecology 2014). The buffer enhancement plan includes planting native conifers (Douglas fir, western red cedar, and western hemlock) and native shrubs to be interspersed among existing native vegetation in the buffer between the development and the steep slope and wetland. This will increase the interception of rainfall in the buffer and improve soil stabilization, reducing the potential for soil erosion on the slopes.

4. *Adequate resources to ensure completion of any required restoration, mitigation and monitoring efforts;*

The applicant will provide a surety at the time of the building permit re-submittal.

5. *The modifications and performance standards included in the proposal are not detrimental to the functions and values of critical area and critical area buffers off-site; and*

No detrimental effects to critical areas or critical area buffers off site will occur.

6. *The resulting development is compatible with other uses and development in the same land use district.*

The subject site is in single-family residential neighborhood. The proposed development is a single-family home, which is compatible with the land use district.

6.0 LUC 20.30P.140 DECISION CRITERIA

Text in italics below is from LUC 20.30P.140, with WRI responses in plain text.

The Director may approve or approve with modifications an application for a Critical Areas Land Use Permit if:

A. The proposal obtains all other permits required by the Land Use Code; and

All other necessary permits will be obtained.

B. The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer; and

The proposed development plan concentrates development in the northwestern corner of the property as far from the on-site critical areas as possible. By consolidating the two existing parcels into one and developing one single-family home instead of two, the plan reduces the amount of wetland buffer impact required to achieve reasonable development of the site as zoned. Modifications were made to the original site plan to minimize the impacts to the wetland buffer. The proposed wetland buffer reduction is less than 75 percent, which is the maximum allowed for buffer averaging, and does not impact special habitat features (large snags) that were observed during the habitat assessment. Further, the buffer enhancement plan will improve the functions of the wetland buffer and ensures that no net loss of functions and values will occur.

C. The proposal incorporates the performance standards of Part 20.25H LUC to the maximum extent applicable; and

No impacts to the steep slopes, buffers, or setbacks are proposed. The Geotechnical Engineering Study concludes that a minimum 30-foot setback is required from the top of the slope. No development will encroach closer than 30 feet from the top of the slope.

D. The proposal will be served by adequate public facilities including streets, fire protection, and utilities; and

The subject site is accessible from 168th Avenue SE and is already served by public facilities including fire protection and utilities.

E. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC 20.25H.210; except that a proposal to modify or remove vegetation pursuant to an approved Vegetation Management Plan under LUC 20.25H.055.C.3.i shall not require a mitigation or restoration plan; and

A mitigation plan that includes vegetation restoration and enhancement is provided below in Section 7 of this report. This mitigation plan is consistent with LUC 20.25H.210.

F. The proposal complies with other applicable requirements of this code.

The proposal complies with the applicable requirements of code and will obtain all other necessary permits.

7.0 BUFFER MITIGATION PLAN

The proposed development will result in 2,572 square feet of impact to the buffer on Wetland A. To compensate for these impacts the applicant proposes to provide a total of 5,600 square feet of buffer enhancement. This represents a >2:1 buffer mitigation ratio.

7.1 MITIGATION SEQUENCING

The City of Bellevue requires that all reasonable efforts be taken to avoid and minimize impacts to critical areas and buffers. If impacts do occur, they must be compensated in the following order of preference (LUC 20.25H.215):

A) Avoiding the impact altogether by not taking a certain action or parts of an action;
Direct impacts to critical areas have been avoided. In order to achieve the applicants' development goals, a small amount of impact to the wetland buffer is unavoidable. The proposed buffer impact area is 2,572 square feet in size.

B) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts;
The consolidation of the two existing parcels and location of the development in the northwestern corner of the site, as far from the wetland as possible, results in less impact than would be required if the lot were each developed with an SFR. The site plan has been modified to minimize buffer impacts to the extent possible.

C) Performing the following types of mitigation (listed in order of preference):

1) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
The buffer impacts are permanent and cannot be restored.

2) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
The buffer impacts cannot be reduced or eliminated over time.

3) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;
The buffer enhancement plan will ensure no net loss of buffer functions and values. To compensate for the 2,572 square feet of unavoidable buffer impact, the applicant proposes to enhance the remainder of the buffer between the development and the wetland by interplanting native conifers and shrubs. This buffer area currently consists of deciduous trees with a sparse understory. The enhancement will improve noise and visual screening, increase native forage resources for wildlife, provide thermal and hiding cover, improve water quality and hydrology function by increasing the interception of rainfall and the filtration capability of the vegetation and by increasing soil stabilization (reducing the potential for soil erosion).

D) Monitoring the hazard or other required mitigation and taking remedial action when necessary.
A five-year monitoring program will ensure the successful establishment of the buffer mitigation measures. Section 8.0 includes details of the monitoring program.

7.2 BUFFER ENHANCEMENT PLAN

The buffer enhancement area is located between the development and the wetland and steep slope. Existing vegetation in this area is comprised of a combination of native and non-native species dominated by red alder and big leaf maple in the canopy and with a sparse understory. All invasive species including, but not limited to, Himalayan blackberry (*Rubus armeniacus*), cut-leaf blackberry (*Rubus laciniatus*), English holly (*Ilex aquifolium*), and English ivy (*Hedera helix*) will be removed from the buffer enhancement area. Roots will be grubbed out to the extent possible to prevent re-growth. Existing native species, snags, and large woody debris will remain.

The following species will be interspersed among existing native vegetation. Species recommended in the City of Bellevue Critical Areas Handbook are included in the proposed planting plan. *The quantity of shrubs is estimated and the actual number to be installed will be determined on site at the time of planting to achieve the specified densities*.

Buffer Enhancement Planting Plan (5,600 SF)

Common Name	***Latin Name***	***Size***	***Spacing***	***Quantity***
Douglas fir	*Pseudotsuga menziesii*	1 gallon	9'	20
Western red cedar	*Thuja plicata*	1 gallon	9'	20
Western hemlock	*Tsuga heterophylla*	1 gallon	9'	20
Vine maple	*Acer circinatum*	1 gallon	4.5'	22
Beaked hazelnut	*Corylus comuta*	1 gallon	6'	20
Oso-berry	*Oemleria cerasiformis*	1gallon	4.5'	24
Salmonberry	*Rubus spectabilis*	1 gallon	4'	26
Red elderberry	*Sambucus racemosa*	1 gallon	4'	26
Oceanspray	*Holodiscus discolor*	1 gallon	6'	20
Snowberry	*Symphoricarpos albus*	1 gallon	4.5'	24

7.3 PLANTING NOTES

Plant between late fall and early spring and obtain all plants from a reputable nursery. Care and handling of all plant materials is extremely important to the overall success of the project. The origin of all plant materials specified in this plan shall be native plants, nursery grown in the Puget Sound region of Washington. Some species substitutions may be allowed with agreement of the contracted ecologist.

Pre-Planting Meeting
Prior to control of invasive species or installation of mitigation plantings, a site meeting between the contracted landscaper and the consulting ecologist may occur to resolve any questions that may arise. During this meeting a discussion regarding plant spacing and proper locations of plant species will occur, as well as an inspection of the plants prior to planting. Minor adjustments to the original design may be required prior to and during construction.

Handling
Plants shall be handled so as to avoid all damage, including: breaking, bruising, root damage, sunburn, drying, freezing or other injury. Plants must be covered during transport. Plants shall not be bound with wire or rope in a manner that could damage branches. Protect plant roots with shade and wet soil in the time period between delivery and installation. Do not lift container stock by trunks, stems, or tops. Do not remove from containers until ready to plant. Water all plants as necessary to keep moisture levels appropriate to the species horticultural requirements. Plants shall not be allowed to dry out. All plants shall be watered thoroughly immediately upon installation. Soak all containerized plants thoroughly prior to installation.

Storage
Plants stored by the Permittee for longer than one month prior to planting shall be planted in nursery rows and treated in a manner suitable to those species' horticultural requirements. Plants must be re-inspected by the landscape architect prior to installation.

Damaged plants
Damaged, dried out, or otherwise mishandled plants will be rejected at installation inspection. All rejected plants shall be immediately removed from the site, and properly replaced.

Plant Names
Plant names shall comply with those generally accepted in the native plant nursery trade. Any question regarding plant species or variety shall be referred to the landscape architect or consulting ecologist. All plant materials shall be true to species and variety and legibly tagged.

Quality and condition
Plants shall be normal in pattern of growth, healthy, well-branched, vigorous, with well-developed root systems, and free of pests and diseases. Damaged, diseased, pest-infested, scraped, bruised, dried out, burned, broken, or defective plants will be rejected. Plants with pruning wounds over 1" in diameter will be rejected.

Roots
All plants shall be balled and burlapped (B&B) or containerized, unless explicitly authorized by the landscape architect and/or consulting ecologist. Rootbound plants or B&B plants with damaged, cracked, or loose rootballs (major damage) will be rejected. Immediately before installation, plants with minor root damage must be root-pruned. Matted or circling roots of containerized plantings must be pruned or straightened and the sides of the root ball must be roughened from top to bottom to a depth of at least an inch.

Sizes
Plant sizes shall be the size indicated in the plant schedule in approved plans, unless approved by the landscape architect or consulting ecologist. Larger stock may be acceptable provided that it has not been cut back to the size specified, and that the root ball is proportionate to the size of the plant. Smaller stock may be acceptable, and preferable under some circumstances, based on site-specific conditions. Measurements, caliper, branching, and balling and burlapping shall conform to the American Standard of Nursery Stock by the American Association of Nurserymen (latest edition).

Form
Evergreen trees shall have single trunks and symmetrical, well-developed form. Deciduous trees shall be single trunked unless specified as multi-stem in the plant schedule. Shrubs shall have multiple stems and be well-branched.

Timing of Planting
Unless otherwise approved by the landscape designer/consulting ecologist, all planting shall occur between October 1 and March 1. Overall, the earlier the plants go into the ground during the dormant period, the more time they have to adapt to the site and extend their root systems before the water demands of summer.

Weeding
Non-native, invasive vegetation in the mitigation area will be hand-weeded from around all installed plants at the time of installation and on a routine basis throughout the monitoring period. No chemical control of vegetation on any portion of the site is recommended without prior approval from the City and consulting ecologist.

Site conditions
The landscaping contractor shall immediately notify the landscape designer and/or consulting ecologist of drainage or soil conditions likely to be detrimental to the growth or survival of plants. Planting operations shall not be conducted under the following conditions: freezing weather, when the ground is frozen, excessively wet weather, excessively windy weather, or in excessive heat.

Planting Pits
Planting pits shall be circular or square with vertical sides, and shall be at least 12" wider in diameter than the root ball of the plant. Break up the sides of the pit in compacted soils. Set plants upright in pits. All burlap shall be removed from the planting pit/rootball. Backfill of native soils shall be worked back into holes such that air pockets are removed without adversely compacting soils.

Fertilizer
Slow release fertilizer may be used if pre-approved by the consulting ecologist. Fertilizers shall be applied only at the base of plantings underneath the required covering of mulch (that does not make contact with stems of the plants). No fertilizers shall be placed within planting holes.

Support Staking
Most shrubs and many trees DO NOT require any staking. If the plant can stand alone without staking in a moderate wind, do not use a stake. If the plant needs support, then strapping or webbing should be used as low as possible on the trunk to loosely brace the tree with two stakes. Do not brace the tree tightly or too high on the trunk. If the tree is unable to sway, it will further lose the ability to support itself. Do not use wire in a rubber hose for strapping as it exerts too much pressure on the bark. As soon as supporting the plant becomes unnecessary, remove the stakes. All stakes must be removed within two (2) years of installation.

Plant Location
Colored surveyors ribbon or other appropriate marking shall be attached to the installed plants to assist in locating the plants while removing the competing non-native vegetation and during the monitoring period. Flagging or ribbon shall be attached to lateral branches rather than the main leader whenever possible.

Arrangement and Spacing
The plants shall be arranged in a pattern with the appropriate numbers, sizes, species, and distribution that are required in accordance with the approved plans. The actual placement of individual plants shall mimic natural, asymmetric vegetation patterns found on similar undisturbed sites in the area. Spacing of the plantings may be adjusted to maintain existing vegetation with the agreement of the landscape designer and/or consulting ecologist.

8.0 PROJECT MONITORING PROGRAM

8.1 MITIGATION GOALS AND OBJECTIVES

The goal of this mitigation plan is to improve the functions and values of the on-site wetland buffer. The objectives of the plan are to eliminate invasive plant species, increase coniferous tree cover and vegetation density in the shrub stratum. Increase plant species diversity and cover, increase browsing, perching, nesting, and cover opportunities for wildlife, increase soil stabilization capacity, and limit erosion.

To achieve the goals previously stated, any invasive plants including but not limited to Himalayan blackberry (*Rubus armeniacus*), cut-leaf blackberry (*Rubus laciniatus*), English holly (*Ilex aquifolium*), and English ivy (*Hedera helix*) from the buffer enhancement area and installing native conifers and shrubs. Plants will be installed among existing native plants, which will be retained. Existing snags and large, woody debris within the buffer enhancement area will also be retained.

Overall, this mitigation project is expected to achieve a net-gain in functions to wildlife, water quality, hydrology, and soil stability in the wetland buffer.

8.2 MONITORING REQUIREMENTS

Requirements for monitoring project:

1. Initial compliance report/as-built map
2. Annual site inspections (in the fall) for five years
3. Annual reports including final report (one report submitted in the fall of each monitored year)

Purpose for Monitoring

The purpose for monitoring shall be to evaluate the project's success. Success will be determined if monitoring shows at the end of five years that the performance standards stated below are met. Access shall be granted to the planting area for inspection and maintenance to the contracted landscaper and/or ecologist and the City during the monitoring period or until the project is evaluated as successful.

Vegetation Monitoring Methodology

At least 2 permanent vegetation sampling points shall be established to monitor the condition of installed enhancement plantings. Monitoring of vegetation should occur annually between May 15 and September 30 (prior to leaf drop), unless otherwise specified.

The following data will be recorded for the enhancement areas:

- Species present
- Aerial cover by native and non-native species
- Quantity of dead installed plants
- General observations

8.2.2 Photo points

At least two permanent photo points will be established within the enhancement areas. Photographs will be taken from photo points to visually record condition of the enhancement areas. Photos shall be taken annually between May 15 and September 30 (prior to leaf drop), unless otherwise specified.

8.2.3 Monitoring Reports

Monitoring reports shall be submitted by December 31 of each year during the monitoring period. As applicable, monitoring reports must include descriptions/data for:

(1) Site plan and vicinity map;
(2) Historic description of project, including date of installation, current year of monitoring, restatement of planting/restoration goals, and performance standards;
(3) Plant survival, vigor, and areal coverage for every plant stratum (sampling point data), and explanation of monitoring methodology in the context of assessing performance standards;
(4) Slope condition and site stability;
(5) Overall conditions, e.g., surrounding land use, use by humans and/or wildlife;
(6) Observed wildlife, including amphibian, avian, and others;

(7) Assessment of invasive biota and recommendations for management;
(8) Color photographs taken from permanent photo points that shall be depicted on the monitoring report map.

8.2.4 Project Success and Compliance

Upon installation and completion of the approved mitigation plan, an inspection by a qualified ecologist and/or City will be made to determine plan compliance. A compliance report will be supplied to the City of Bellevue within 30 days of the completion of planting. The Applicant or consulting ecologist/landscape designer will perform condition monitoring of the plantings in the early fall of each year for five years. A written report describing the monitoring results will be submitted to the City in the fall after each site inspection of each monitored year. Final inspection will occur five years after completion of this project, and a report on overall project success will be prepared.

Performance Standards

Project success will be measured by survival and areal cover of native and invasive plants. The mitigation areas must achieve the following Performance Standards to be considered successful:

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year5**
Installed Plant Survival	100%	≥90%	≥80%	≥80%	≥80%
Areal cover of Native Trees & Shrubs	≥20%	≥30%	≥40%	≥60%	≥80%
Invasive/Non-native species cover	<5%	<5%	<5%	<5%	<5%

Notes:
-Survival applies only to installed plants
-Existing, volunteer, and installed native plants may be counted toward areal cover

9.0 MAINTENANCE PROGRAM

This mitigation project will require periodic maintenance to replace mortality of planted species and control invasive, non-native plant species. The mitigation planting areas will be maintained (at a minimum) in spring and late summer of each year for the five-year monitoring period. Maintenance may include, but will not be limited to, removal of competing species and non-native vegetation (by hand), irrigation, replacement of dead plants, and/or the replacement of mulch during each maintenance period. The Permittee is responsible for ensuring maintenance occurs as needed in all monitoring years.

Duration and Extent

In order to achieve performance standards, the Permittee shall have the planting area maintained for the duration of the five-year monitoring period. Maintenance will include: watering, weeding around the base of installed plants, pruning, replacement, re-staking, removal of all classes of noxious weeds (see Washington State Noxious Weeds List), and any other measures needed to insure plant survival.

Survival

The Permittee shall be responsible for the health of 100 percent of all newly installed plants for *one growing season* after installation has been accepted by the City. A growing season for these purposes

is defined as occurring from spring to spring (March 15 to March 15 of the following year). For fall installation (often required), the growing season will begin the following spring. The Permittee shall replace any plants that are failing, weak, defective in manner of growth, or dead during this growing season.

Installation Timing for Replacement Plants
Replacement plants shall be installed between October 1 and March 1, unless otherwise determined by the consulting ecologist and/or City staff.

Standards for Replacement Plants
Replacement plants shall meet the same standards for size and type as those specified for the original installation unless otherwise directed by the landscape designer, consulting ecologist, and/or City staff.

Herbicides/Pesticides and Fertilizer
Chemical control of invasive, non-native species, if necessary, shall be applied only after approval by the City of Bellevue or consulting ecologist. Herbicide shall be applied by a licensed applicator following all label instructions. Chemical control and fertilization within the mitigation areas will only be performed if deemed necessary.

Watering/Irrigation
Water should be provided during the dry season (generally at least June through September) to insure plant survival and establishment. Water should be applied at a rate of one inch of water twice per week during the dry season for the first year and one inch of water per week during the dry season for the second year. The landscaping contractor and/or property owners will determine if additional watering is necessary. Due to the steep slopes on the site, hand watering or a drip system, that waters for short periods at a time, shall be used to prevent any erosion or slope stability issues.

10.0 CONTINGENCY PLAN

If, during any of the annual inspections, performance standards are not being met for species survival, additional plants of the same species will be added to the mitigation area. If invasive, non-native species exceed 5 percent cover (as measured by areal cover), manual control shall occur. If any of these situations persist to the next inspection, a meeting with the landscape designer/consulting ecologist and the Permittee will be held to decide upon contingency plans. Elements of a contingency plan may include but will not be limited to more aggressive weed control, mulching, replanting with larger plant material, species substitution, fertilization, soil amendments, and/or irrigation.

11.0 PERFORMANCE BOND

The City of Bellevue may require a performance bond or maintenance assurance device if it is determined to be necessary. The City will determine the type and amount of assurance device required. The performance or maintenance assurance device amount is typically determined from the estimated cost of work. An estimate of the cost of project installation is provided below.

Cost of Plants and Labor 1-gal pots ($11.50 per plant) = 220 plants	$2,530.00
TOTAL ESTIMATED COST	$2,530.00

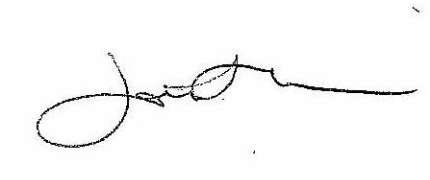
12.0 USE OF THIS REPORT

This Critical Areas Report & Buffer Mitigation Plan is supplied to David and Maria Federman as a means of determining on-site critical area conditions, as required by the City of Bellevue during the permitting process. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.



Joie Goodman
Senior Ecologist
Professional Wetland Scientist

13.0 REFERENCES

Anderson, P., S. Meyer, P. Olson, and E. Stockdale. 2016. *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*. October 2016 Final Review. Washington State Department of Ecology, Shorelands and Environmental Assistance Program. Lacey, WA. Publication # 16-06-029.

Bellevue, City of. 2021. *Bellevue Land Use Code*. Ordinance 6589, passed July 2021.

Bellevue, City of. 2021. *City of Bellevue Critical Hazards Maps.* *http://cobgis.maps.arcgis.com/home/item.html?id=8a2e50c0ce6d473f93054798085ff30f*

Bellevue, City of. *Critical Areas Handbook*. Prepared by City of Bellevue and The Watershed Company.

Brinson, M.M. 1993. *A Hydrogeomorphic Classification for Wetlands.* Technical Report WRPDE-4. US Army Engineers Waterways Experiment Station, Vicksburg, MS.

Cowardin, L.M., V. Carter, F.C. Golet and E.T. Laroe. 1979. *Classification of Wetlands and Deep Water Habitats of the United States.* U.S. Fish and Wildlife Service. FWS/OBS 79/31.

Hruby, T. 2014. *Washington State Wetland Rating System for Western Washington: 2014 Update*. Publication #14-06-029. Olympia, WA: Washington State Department of Ecology.

King County. 2021. *King County iMap Interactive Mapping Tool.* http://gismaps.kingcounty.gov/iMap/.

Munsell Color. 2012. *Munsell Soil Color Book.* Munsell Color, Grand Rapids, MI.

Natural Resources Conservation Service (NRCS). 2021. *Web Soil Survey*. United States Department of Agriculture. http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

Sheldon, D., T. Hruby, P. Johnson, K. Harper, A. McMillan, T. Granger, S. Stanley, and E. Stockdale. March 2005. *Wetlands in Washington State - Volume 1: A Synthesis of the Science.* Washington State Department of Ecology. Publication #05-06-006. Olympia, WA.

U.S. Army Corps of Engineers. 2018. *National Wetland Plant List, version 3.4.* Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH. http://wetland-plants.usace.army.mil/

U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0).* Vicksburg, MS

U.S. Fish & Wildlife Service (USFWS). 2021. *National Wetlands Inventory (NWI) Online Mapper*. http://www.fws.gov/wetlands/Data/Mapper.html.

WA Department of Ecology. 2014. 2012 Stormwater Management Manual for Western Washington, as Amended in December 2014. Washington State Department of Ecology. Publication #14-10-055.

WA Department of Fish & Wildlife (WDFW). 2021a. *Priority Habitat and Species (PHS) Interactive Map*. http://apps.wdfw.wa.gov/phsontheweb/

WA Department of Fish & Wildlife (WDFW). 2021b. *SalmonScape Online Mapping Application*. http://apps.wdfw.wa.gov/salmonscape/map.html

WA Department of Natural Resources (DNR). 2021. *Forest Practices Activity Mapping Tool (FPAMT)*. https://fpamt.dnr.wa.gov/default.aspx

APPENDIX A:
GEOTECHNICAL ENGINEERING STUDY
(GEOTECH CONSULTANTS, INC.; SEPTEMBER 7, 2021)

GEOTECH
CONSULTANTS, INC.

2401 10th Ave E
Seattle, Washington 98102
(425) 747-5618

September 7, 2021

JN 21339

David and Maria Federman
5508 Northeast 7th Place
Renton, Washington 98059
via email: david.federman@outlook.com & maria.federman@outlook.com

Subject: **Geotechnical Engineering Study**
Proposed New Residence
6712 & 6716 – 168th Avenue Southeast
Bellevue, Washington

Dear Mr. and Mrs. Federman:

We are pleased to present this geotechnical engineering report for the new residence to be constructed at the subject property. The scope of our services consisted of assessing site surface and subsurface conditions, and then developing this report to provide design considerations for slope stability and foundations. This work was authorized by your acceptance of our proposal, P-10934, dated May July 27, 2021.

Based on the preliminary site plan prepared by H2D Architects, dated August 25, 2021, we understand that a new residence is planned to be constructed near the northwestern corner of the undeveloped parcels. A new driveway alignment will extend from the western street, leading to a parking area. Garage space will be located east of the driveway, and the main body of the residence will be located east of the garage. The residence will be skewed slightly from the garage alignment, extending southeast from the garage and driveway. No elevations had been prepared at this time, but we anticipate that both the garage and residence will consist of at least two stories and may be underlain by a basement. Depending on final grading for the new driveway, the lower-level slab of the garage may need to be cut into the existing slope to allow for a relatively flat driveway alignment. A patio space is shown to extend off the southern end of the residence, and a new retaining wall is shown to flank much of the northern and eastern sides of the development area, likely to create a level yard area surrounding the house. The residence and garage are shown to extend within the 65-foot prescriptive buffer from the top of the southern steep slope per Bellevue code and are set outside of the 75-foot prescriptive buffer from the toe of the eastern steep slope. Preliminary property line setbacks of approximately 5.75 feet from the north are shown. The residence and garage will be set well away from the eastern, southern, and western property lines, but site features such as the new driveway and perimeter site walls, extend to within a few feet of the property lines. No finish floor elevations have been proposed at this time; thus, excavations for the new residence and garage could range from as little as a few feet, to upwards of 10 feet depending on the garage configuration and final residence design. We anticipate that a retaining wall may be needed along the northern edge of the driveway to facilitate the cut.

If the scope of the project changes from what we have described above, we should be provided with revised plans in order to determine if modifications to the recommendations and conclusions of this report are warranted.

SITE CONDITIONS

The subject property is located east of 168th Avenue Southeast near the top of Cougar Mountain in Bellevue. The rectangular shaped site consists of two contiguous lots that comprise a total site area of 1.2-acres. The site is bordered to the north, east, and south by large, single-family parcels, and to the west by 168th Avenue Southeast.

The site is currently vacant, and is covered with underbrush, and numerous younger and mature trees. The grade across the undeveloped site slopes downward from east to the west and south, with a total elevation change of approximately 80 feet across the site bounds. Initially, the grade slopes downward to steeply from the eastern, upslope property line at an inclination ranging from 40 to 60 percent. The steep eastern slope continues to the southwest before terminating at the base of a short ravine located on the southern parcel. On the northern parcel, the eastern steep slope terminates farther east, where the grade continues across a gently moderately sloped terrace where the proposed development area is located. This gentle to moderate grade continues to the west, before sloping down from the upper terrace to the elevation of 168th Avenue Southeast.

Steep slope areas exist on the subject property east and south of the proposed residence footprint where the sloped areas are inclined from approximately 40 to 60 percent over elevation changes in excess of 10 feet. The slopes to the east and south of the proposed residence appear to be mostly natural. These steeply sloped areas follow the alignment of a small stream which flows through the base of the ravine feature running through the southern parcel. The steep eastern slope continues to the north and south at least one parcel before reducing in height and size, and the southern steep slope is localized to within the site bounds. These steep slopes are inclined in excess of 40 percent over elevation changes of greater than 10 feet and would meet the City of Bellevue Criteria for a Critical Area. While the slope to the west of the driveway is mapped as steep, it appears to be under 10 feet in height, and would not meet the City of Bellevue Criteria for a Critical Area.

We saw no indications of recent slope movement during our time onsite. Many of the older trees exhibited multiple bends in their trunks approximately more than 10 feet from the bases of their trunks. This would indicate that some surficial soil creep has occurred within the upper, weathered soils in the past.

As stated above, the adjacent lots are developed with large, single-family residences. The adjacent northern, eastern, and southern residences are all set at a higher elevation than the site and contain multi-story residences and extensively landscaped and hardscaped site features. The residences are all set at least 10 feet from the property lines.

SUBSURFACE

The subsurface conditions beneath the proposed development area were explored by excavating four test pits at the approximate locations shown on the Site Exploration Plan, Plate 2. Our exploration program was based on the proposed construction, anticipated subsurface conditions and those encountered during exploration, and the scope of work outlined in our proposal.

The test pits were excavated on August 18, 2021 with a tracked excavator. A geotechnical engineer from our staff observed the excavation process, logged the test pits, and obtained representative samples of the soil encountered. "Grab" samples of selected subsurface soil were collected from the backhoe bucket. The Test Pit Logs are attached to this report as Plates 3 and 4.

Soil Conditions

The four test pits were excavated from east to west across the development area and encountered similar subsurface soil conditions. Beneath the ground surface, the four test pits encountered native, dry, loose silty sand containing gravel, cobbles, roots, organics, and large pieces of weathered sandstone. This loose surficial soil extended to depths of 3 to 4.5 feet in the test pits, and was underlain by heavily rusted, highly fractured, heavily weathered silty sand that is interpreted as heavily weathered sandstone. This upper layer of sandstone was observed to be in a loose to medium-dense state and heavily disturbed. Less fractured, dense, weathered to heavily weathered sandstone was encountered beneath the upper, highly fractured layer at depths of 4.5 to 6 feet. This underlying weathered sandstone was observed to be much more competent than the surficial loose soils and extended to the base of the test pits at a depth of 7 feet.

We are also aware that a previous geotechnical study was prepared by Terra Associates, Inc. for one of the prior property owners. This report, dated January 15, 2018, details the excavation of three test pits for the proposed development at the time. These test pits encountered subsurface soil layers consistent with what was encountered in our recent test pits.

It is common to encounter weathered bedrock at relatively shallow depths in the Cougar Mountain area.

Although our explorations did not encounter cobbles or boulders, they are often found in soils that have been deposited by glaciers or fast-moving water.

Groundwater Conditions

No groundwater seepage was observed during drilling, which occurred in the middle of summer. It should be noted that groundwater levels vary seasonally with rainfall and other factors. We anticipate that during wet weather, at least isolated groundwater could be found in more permeable soil layers, fracture planes in the sandstone, and between the looser near-surface soil and the underlying sandstone.

The stratification lines on the logs represent the approximate boundaries between soil types at the exploration locations. The actual transition between soil types may be gradual, and subsurface conditions can vary between exploration locations. The logs provide specific subsurface information only at the locations tested. If a transition in soil type occurred between samples in the test pits, the depth of the transition was interpreted. The relative densities and moisture descriptions indicated on the test boring logs are interpretive descriptions based on the conditions observed during excavation.

The compaction of test pit backfill was not in the scope of our services. The test pits were backfilled with excavated soil that was lightly tamped into place. Loose soil will therefore be found in the area of the test pits. If this presents a problem, the backfill will need to be removed and replaced with structural fill during construction.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

THIS SECTION CONTAINS A SUMMARY OF OUR STUDY AND FINDINGS FOR THE PURPOSES OF A GENERAL OVERVIEW ONLY. MORE SPECIFIC RECOMMENDATIONS AND CONCLUSIONS ARE CONTAINED IN THE REMAINDER OF THIS REPORT. ANY PARTY RELYING ON THIS REPORT SHOULD READ THE ENTIRE DOCUMENT.

As anticipated, the site is underlain by dense, weathered sandstone, which is not prone to deep seated instability, and will be stable under static and design earthquake conditions. However, there is a potential for movement in the looser surficial soils encountered beneath the ground surface. The recommendations of this report are intended to: 1) prevent the new development from adversely impacting the stability of the steep slope, and 2) to protect the new construction from damage in the event of future shallow soil movement. As discussed below, a slope stability analysis was conducted on a cross section running through the proposed development area to determine the approximate post-construction stability in the area of the planned work with respect to the southern steep slope. Based on our analyses, we found that, in order to meet the City of Bellevue code minimums, a minimum total buffer of 30 feet must be maintained from the top of the southern steep slope. The new residence will be set outside of the prescriptive 75-foot buffer from the toe of the eastern steep slope. Further discussions of our slope stability analysis can be found in subsequent sections of this report.

New foundations for the proposed development should not bear on the surficial weathered soils due to the likelihood for excessive post-construction settlement. All new foundations should bear directly upon the native, dense, weathered sandstone encountered beneath this loose soil. Excavations into this dense weathered bedrock are typically conducted using a toothed bucket due to the soil's density. This typically leaves several inches of loose, disturbed soils at the base of the excavation. We recommend that all final foundation excavations be conducted using a smooth excavator bucket, grade bar, or flat blade shovel so that the foundation subgrades can be scraped clean of any loose soil or debris prior to constructing the foundations. The underlying weathered sandstone is silty, fine-grained, and highly moisture sensitive. It would be practical of the contractor to cover the base of the foundation excavations with a thin layer of clean, angular rock such as ballast rock to protect the excavated subgrades, especially if site work will be conducted during the wet season. This crushed rock layer will help to prevent subgrade disturbance during excavation and foundation construction and will help facilitate the removal of any accumulated runoff from within the excavation. Additional recommendations can be found in the ***Conventional Foundations*** section of this report.

The extents of the excavations for the new developments are not fully known at this time. Based on the soils encountered in our excavations, a temporary excavation inclination of no steeper than a 1:1 (Horizontal:Vertical) is appropriate for the upper, about 5 to 6 feet of loose silty sand and highly weathered sandstone. Once the more competent, weathered sandstone has been reached, the excavation can be steepened to a 0.75:1 (H:V). For overall slope heights of less than 12 feet, the cut can manifest itself as a 4-foot vertical cut at the toe of a 1:1 (H:V) slope. Vertical excavations should not be made on, or near the shared property lines, or near any adjacent settlement sensitive structure. Based on the preliminary site plan, it appears that most of the excavations will be able to be contained within the site boundaries. However, the proposed northern setback is shown to be set at ~5.75', and a long retaining wall is set within 3 feet of the property line. Depending on the final site configuration, either temporary excavation easements, or temporary shoring may be

needed to facilitate the northern excavations. We can provide temporary shoring recommendations once final siting locations and finish floor and finish grade elevations have been roughly determined.

Runoff from the new construction must not be discharged toward, or onto, the steep slopes or be allowed to flow off the site. The upper soils on the site are variable and silty, and the underlying native sandstone is impervious. Infiltration of runoff on the property is infeasible, due to the impervious nature of the underlying materials, and the potential for adverse stability impacts on the site. The feasibility of onsite dispersion could be explored, depending on the site configuration and proposed location of dispersion systems with respect to the critical areas.

The soils that will be excavated for the new foundations will consist of dry, variable silty sand and weathered bedrock. These soils are fine-grained, silty, moisture sensitive, and are not free draining. The weathered bedrock is exceedingly difficult to adequately compact for use as structural fill, even under the most optimum site and weather conditions. Considering the onsite slopes, and relatively limited access for specialty compaction equipment, the onsite soils should not be used for structural fill, or where free draining backfill is needed. The excavated soils should not be stockpiled, or placed on, or near the top of the southern steep slope. Depending on the final site design, this may require that much of the excavated soils be exported offsite.

The erosion control measures needed during the site development will depend heavily on the weather conditions that are encountered. We anticipate that a silt fence will be needed around the downslope sides of any cleared areas. Existing pavements, ground cover, and landscaping should be left in place wherever possible to minimize the amount of exposed soil. Rocked staging areas and construction access roads should be provided to reduce the amount of soil or mud carried off the property by trucks and equipment. Trucks should not be allowed to drive off of the rock-covered areas. Cut slopes and soil stockpiles should be covered with plastic during wet weather. Following clearing or rough grading, it may be necessary to mulch or hydroseed bare areas that will not be immediately covered with landscaping or an impervious surface. On most construction projects, it is necessary to periodically maintain or modify temporary erosion control measures to address specific site and weather conditions.

The drainage and/or waterproofing recommendations presented in this report are intended only to prevent active seepage from flowing through concrete walls or slabs. Even in the absence of active seepage into and beneath structures, water vapor can migrate through walls, slabs, and floors from the surrounding soil, and can even be transmitted from slabs and foundation walls due to the concrete curing process. Water vapor also results from occupant uses, such as cooking, cleaning, and bathing. Excessive water vapor trapped within structures can result in a variety of undesirable conditions, including, but not limited to, moisture problems with flooring systems, excessively moist air within occupied areas, and the growth of molds, fungi, and other biological organisms that may be harmful to the health of the occupants. The designer or architect must consider the potential vapor sources and likely occupant uses, and provide sufficient ventilation, either passive or mechanical, to prevent a buildup of excessive water vapor within the planned structure.

SUMMARY OF SLOPE STABILITY ANALYSES

As part of the preparation of this report, we have conducted a slope stability analysis on a cross section running through the area of the proposed development. Attached to this report are the results of our slope stability analyses using the program Slope/W under both static and seismic loading conditions. The newly adopted ASCE 7-16 (2018 IBC) was used for reference in determining the seismic parameters for this project.

As discussed above in the ***General*** section, in order to meet the City of Bellevue code minimums for static and dynamic scenarios, a minimum total buffer of 30 feet must be maintained from the top of the southern steep slope, as measured from the edge of the development area, including the patio extending off the southern side of the residence. Results of our slope stability analysis yielded factors of safety of 2.14 and 1.16 for static and dynamic scenarios, respectively. These factors of safety exceed the City of Bellevue code minimums for areas at high risk of failure (1.5 and 1.15 for static and dynamic scenarios, respectively). The referenced slope stability cross section location can be found on Plate 2, and the slope stability analyses are attached to this report as Appendix A.

CRITICAL AREAS DISCUSSION

The onsite steep slopes meet the City of Bellevue's criteria for both a steep slope and a landslide hazard. The planned development lies within the City's prescriptive 65-foot building setback (50-foot buffer and 15-foot foundation setback) from the top of a steep slope and lies outside of the City's prescriptive 75-foot setback from the toe of the eastern steep slope, contained in the municipal code. As a result, we expect that a Critical Area Land Use Permit (CALUP) will need to be obtained. In order to respond to specific geotechnical criteria in the Bellevue Municipal Code for a CALUP, we present the following discussion:

20.25H.125 Performance standards – Landslide hazards and steep slopes.

A. The existing grades surrounding the development area are mostly natural and have formed over years of weathering and previous slow surficial soil creep. The excavations will be limited to the proposed site development, with will encroach within the prescriptive 65-foot buffer from the top of the southern steep slope. However, the excavations will be limited to what is needed to reach the competent bearing soils to construct the new foundations. No modifications to the onsite mapped steep slopes are planned to occur.

B. The new construction will extend into the prescriptive 65-foot buffer from the top of the southern steep slope and will be located outside the prescriptive 75-foot buffer from the toe of the eastern steep slope. Again, the new foundations will be founded upon the underlying, competent weathered bedrock, which is not susceptible to deep seated instability, and no modifications to the onsite steep slopes are planned as part of the site development.

   As part of the submitted plans and critical area report, a temporary erosion and sedimentation control (TESC) plan will likely need to be generated. This plan will clearly delineate the area of construction, as well as the means and methods used to reduce the erosion potential and potential for disturbance outside of the construction area. The areas surrounding the new residence will be landscaped to maintain appropriate permanent erosion control.

C. The proposed development will not result in greater risk or a need for increased buffers on neighboring properties. This is due to the lack of any nearby residence, and the recommendation of bearing all new foundations upon the underlying dense, weathered bedrock. The existing drainage will not be adversely impacted by the planned development. No new drainage should be allowed to flow onto the steep slopes.

D. Based on the provided plans at the time of writing this report, no significant retaining walls will be needed for the new construction. A new site wall is shown lining the eastern and northern sides of the development area, but we anticipate that the retaining wall will be less than 4 feet in height.

E. The planned residence, and garage will be considered impervious surfaces. Outside of these developments, we anticipate that the remainder of the site developments will be permeable where possible. While a large amount of impervious surface will be created due to the proposed development, a robust drainage system will need to be constructed to manage the collected runoff. This runoff will be directed away from the southern steep slopes to an appropriate facility, which will incrementally improve the long-term stability of the southern steep slope.

F. There is no planned grading of the steep slopes to the east and south of the development area.

G. Where applicable, the foundation walls for the new development will incorporate retaining walls to retain the changes in grades. No rockeries are anticipated as part of the proposed development.
H. Not applicable. No construction is proposed to occur on any steep slopes.
I. Not applicable. Parking or garages will not be constructed on slopes in excess of 40 percent or as part of the proposed development. Therefore, piled support structures do not need to be considered.
J. Outside of the footprint of the new construction, we expect that all areas of new permanent disturbance and all areas of temporary disturbance will be mitigated with erosion control plans as a part of the building permit.

Section 20.25H.140 Critical Areas Report – Additional Provisions for Landslide Hazards and Steep Slopes:

A. Not applicable. The site is not in a coal mine hazard.
B. 1. The final submitted critical area report will contain a site plan for the proposal as well as a topographic survey. We anticipate that a recent topographic survey will be needed as part of this submittal.

2. This geotechnical report includes an assessment of the onsite soils as well as a review of the site history including publicly available information regarding previous geologic events and site grading. No information regarding these topics were found in our research, but conclusions regarding lot grading and fill placement were able to be made based on our time at the project site, as well as the subsurface conditions logged in our test pits. Please refer to the ***Surface, Subsurface***, and ***General*** sections of the report.

3. The above discussions contain descriptions of the proposed project, as well as its potential impact on the hazard areas and surrounding properties. The foundations will be supported on the underlying, competent, dense, weathered sandstone. The underlying weathered sandstone is not prone to deep-seated instability. In bearing the new foundation on the competent weathered bedrock and maintaining a minimum total buffer of 30 feet from the top of the southern steep slope, the stability of the existing slope will not be adversely affected, and the proposed development will not increase the possibility for adversely impacting the adjacent lots.

4. The proposed development will encroach within the City of Bellevue prescriptive steep slope buffer of 65 feet from the top of the wester steep slope and will stay outside of the 75-foot buffer from the toe of the eastern slope. The steep slope appears to be mostly natural. The proposed perimeter of the development area is shown to extend to approximately 30 feet from the top of the southern steep slope. Given that all new foundations will be founded upon the competent, weathered bedrock, and our completed slope stability analysis showing that the City of Bellevue Code minimum factors of safety can be met without additional mitigation measures, it is our opinion that the construction of the new development will have a negligible effect on the existing steep slopes. Provided the recommendations presented in this report are incorporated into the residence design and carried out during construction, it is our opinion that a minimum buffer and setback of 30 feet from the southern steep slope is adequate to mitigate the landslide hazard. The proposed development will not, in any way, increase the stability of the surficial, weathered soils. Predicting the behavior of any slope in the Puget Sound area is not precise, and shallow instabilities can often occur on these slopes, particularly following extended periods of rainfall or an earthquake. The current, and any future property owners should be made well aware of this, as there always exists some risk with owning property containing critical areas.

Section 20.25H.145 Critical Areas Report – Approval of Modification:

A. The proposal will not increase the geological hazards to adjacent properties due to being supported on the underlying, competent, weathered bedrock. If any future instability was to occur on the southern slope, it would likely occur as a small mud or debris flow that would travel to the base of the ravine.
B. The proposed modifications to the onsite buffers will not adversely impact other critical areas due to the use of conventional foundations bearing on the competent weathered bedrock, and the implementation of a robust drainage system which will direct the collected runoff away from the steep slopes and wetland.

C. The hazard to the project is mitigated to a level equal to or less than would exist if the proposed modifications to critical area buffers were not approved. The new foundations will bear on the underlying competent weathered bedrock, which is not susceptible to deep-seated instability. This will act to prevent a surcharge load to the loose fill soil on the slope and will not further adversely affect the critical area.
D. The proposed development protects life safety under the conditions that we anticipate. Bearing the new foundations on the underlying competent weathered bedrock found beneath the surficial loose soils will help to protect the new foundations in the event of shallow slope movement, aiding in protecting the new residence from catastrophic foundation collapse.
E. This geotechnical report is intended to satisfy the criteria for a geotechnical report demonstrating no adverse impacts on stability of surrounding slopes or structures.
F. From our understanding of the current development proposal, it will comply with best management practices.
G. We are not aware of any species of importance in the planned work area.

Geotech Consultants, Inc. should be allowed to review the final development plans to verify that the recommendations presented in this report are adequately addressed in the design. Such a plan review would be additional work beyond the current scope of work for this study, and it may include revisions to our recommendations to accommodate site, development, and geotechnical constraints that become more evident during the review process.

We recommend including this report, in its entirety, in the project contract documents. This report should also be provided to any future property owners so they will be aware of our findings and recommendations.

SEISMIC CONSIDERATIONS

In accordance with the International Building Code (IBC), the site class within 100 feet of the ground surface is best represented by Site Class Type C (Very Dense Soil and Soft Rock). As noted in the USGS website, the mapped spectral acceleration value for a 0.2 second (S_s) and 1.0 second period (S_1) equals 1.37g and 0.47g, respectively.

The IBC and ASCE 7 require that the potential for liquefaction (soil strength loss) during an earthquake be evaluated for the peak ground acceleration of the Maximum Considered Earthquake (MCE), which has a probability of occurring once in 2,475 years (2 percent probability of occurring in a 50-year period). The competent sedimentary rock beneath the site is not susceptible to seismic liquefaction under the ground motions of the MCE because of their dense nature. The loose soils closer to the ground surface are not susceptible to liquefaction, due to the lack of a defined groundwater table.

CONVENTIONAL FOUNDATIONS

The proposed structure can be supported on conventional continuous and spread footings bearing on undisturbed, native, weathered sandstone, or on structural fill placed above this competent native soil. See the section entitled ***General Earthwork and Structural Fill*** for recommendations regarding the placement and compaction of structural fill beneath structures. Prior to placing any structural fill beneath foundations, the excavation should be observed by the geotechnical engineer to document that adequate bearing soils have been exposed.

We recommend that continuous and individual spread footings have minimum widths of 16 and 24 inches, respectively. Exterior footings should also be bottomed at least 18 inches below the lowest

adjacent finish ground surface for protection against frost and erosion. The local building codes should be reviewed to determine if different footing widths or embedment depths are required. Footing subgrades must be cleaned of loose or disturbed soil prior to pouring concrete. Depending upon site and equipment constraints, this may require removing the disturbed soil by hand.

An allowable bearing pressure of 2,500 pounds per square foot (psf) is appropriate for footings supported on competent native soil. A one-third increase in this design bearing pressure may be used when considering short-term wind or seismic loads. For the above design criteria, it is anticipated that the total post-construction settlement of footings founded on competent native soil, or on structural fill up to 5 feet in thickness, will be about one-half-inch, with differential settlements on the order of one-half-inch in a distance of 25 feet along a continuous footing with a uniform load.

Lateral loads due to wind or seismic forces may be resisted by friction between the foundation and the bearing soil, or by passive earth pressure acting on the vertical, embedded portions of the foundation. For the latter condition, the foundation must be either poured directly against relatively level, undisturbed soil or be surrounded by level, well-compacted fill. We recommend using the following ultimate values for the foundation's resistance to lateral loading:

PARAMETER	ULTIMATE VALUE
Coefficient of Friction	0.45
Passive Earth Pressure	300 pcf

Where: pcf is Pounds per Cubic Foot, and Passive Earth Pressure is computed using the Equivalent Fluid Density.

If the ground in front of a foundation is loose or sloping, the passive earth pressure given above will not be appropriate. The above ultimate values for passive earth pressure and coefficient of friction do not include a safety factor.

FOUNDATION AND RETAINING WALLS

Retaining walls backfilled on only one side should be designed to resist the lateral earth pressures imposed by the soil they retain. The following recommended parameters are for walls that restrain level backfill:

PARAMETER	VALUE
Active Earth Pressure *	40 pcf
Passive Earth Pressure	300 pcf
Coefficient of Friction	0.45
Soil Unit Weight	130 pcf

Where: pcf is Pounds per Cubic Foot, and Active and Passive Earth Pressures are computed using the Equivalent Fluid Pressures.

*** For a restrained wall that cannot deflect at least 0.002 times its height, a uniform lateral pressure equal to 10 psf times the height of the wall should be added to the above active equivalent fluid pressure. This applies only to walls with level backfill.**

The design values given above do not include the effects of any hydrostatic pressures behind the walls and assume that no surcharges, such as those caused by slopes, vehicles, or adjacent foundations will be exerted on the walls. If these conditions exist, those pressures should be added to the above lateral soil pressures. Where sloping backfill is desired behind the walls, we will need to be given the wall dimensions and the slope of the backfill in order to provide the appropriate design earth pressures. The surcharge due to traffic loads behind a wall can typically be accounted for by adding a uniform pressure equal to 2 feet multiplied by the above active fluid density. Heavy construction equipment should not be operated behind retaining and foundation walls within a distance equal to the height of a wall, unless the walls are designed for the additional lateral pressures resulting from the equipment.

The values given above are to be used to design only permanent foundation and retaining walls that are to be backfilled, such as conventional walls constructed of reinforced concrete or masonry. It is not appropriate to use the above earth pressures and soil unit weight to back-calculate soil strength parameters for design of other types of retaining walls, such as soldier pile, reinforced earth, modular or soil nail walls. We can assist with design of these types of walls, if desired.

The values for friction and passive resistance are ultimate values and do not include a safety factor. Restrained wall soil parameters should be utilized the wall and reinforcing design for a distance of 1.5 times the wall height from corners or bends in the walls, or from other points of restraint. This is intended to reduce the amount of cracking that can occur where a wall is restrained by a corner.

Wall Pressures Due to Seismic Forces

Per IBC Section 1803.5.12, a seismic surcharge load need only be considered in the design of walls over 6 feet in height. A seismic surcharge load would be imposed by adding a uniform lateral pressure to the above-recommended active pressure. The recommended seismic surcharge pressure for this project is 9**H** pounds per square foot (psf), where **H** is the design retention height of the wall. Using this increased pressure, the safety factor against sliding and overturning can be reduced to 1.2 for the seismic analysis.

Retaining Wall Backfill and Waterproofing

Backfill placed behind retaining or foundation walls should be coarse, free-draining structural fill containing no organics. This backfill should contain no more than 5 percent silt or clay particles and have no gravel greater than 4 inches in diameter. The percentage of particles passing the No. 4 sieve should be between 25 and 70 percent. A minimum 12-inch width of free-draining gravel or clean sand and a drainage composite similar to Miradrain 6000 should be placed against the backfilled retaining walls. The gravel and drainage composites should be hydraulically connected to the foundation drain system. Free draining backfill should be used for the entire width of the backfill where seepage is encountered. The later section entitled ***Drainage Considerations*** should also be reviewed for recommendations related to subsurface drainage behind foundation and retaining walls.

The purpose of these backfill requirements is to ensure that the design criteria for a retaining wall are not exceeded because of a build-up of hydrostatic pressure behind the wall. Also, subsurface drainage systems are not intended to handle large volumes of water from surface runoff. The top 12 to 18 inches of the backfill should consist of a compacted, relatively impermeable soil or topsoil, or the surface should be paved. The ground surface must also slope away from backfilled walls at one to 2 percent to reduce the potential for surface water to percolate into the backfill.

Water percolating through pervious surfaces (pavers, gravel, permeable pavement, etc.) must also be prevented from flowing toward walls or into the backfill zone. Foundation drainage and waterproofing systems are not intended to handle large volumes of infiltrated water. The compacted subgrade below pervious surfaces and any associated drainage layer should therefore be sloped away. Alternatively, a membrane and subsurface collection system could be provided below a pervious surface.

It is critical that the wall backfill be placed in lifts and be properly compacted, in order for the above-recommended design earth pressures to be appropriate. The recommended wall design criteria assume that the backfill will be well-compacted in lifts no thicker than 12 inches. The compaction of backfill near the walls should be accomplished with hand-operated equipment to prevent the walls from being overloaded by the higher soil forces that occur during compaction. The section entitled ***General Earthwork and Structural Fill*** contains additional recommendations regarding the placement and compaction of structural fill behind retaining and foundation walls.

The above recommendations are not intended to waterproof below-grade walls, or to prevent the formation of mold, mildew, or fungi in interior spaces. Over time, the performance of subsurface drainage systems can degrade, subsurface groundwater flow patterns can change, and utilities can break or develop leaks. Therefore, waterproofing should be provided where future seepage through the walls is not acceptable. This typically includes limiting cold-joints and wall penetrations and using bentonite panels or membranes on the outside of the walls. There are a variety of different waterproofing materials and systems, which should be installed by an experienced contractor familiar with the anticipated construction and subsurface conditions. Applying a thin coat of asphalt emulsion to the outside face of a wall is not considered waterproofing and will only help to reduce moisture generated from water vapor or capillary action from seeping through the concrete. As with any project, adequate ventilation of basement and crawl space areas is important to prevent a buildup of water vapor that is commonly transmitted through concrete walls from the surrounding soil, even when seepage is not present. This is appropriate even when waterproofing is applied to the outside of foundation and retaining walls. We recommend that you contact an experienced envelope consultant if detailed recommendations or specifications related to waterproofing design or minimizing the potential for infestations of mold and mildew are desired.

SLABS-ON-GRADE

The building floors can be constructed as slabs-on-grade atop competent native soil, or on structural fill placed atop the competent native soils. The subgrade soil must be in a firm, non-yielding condition at the time of slab construction or underslab fill placement. Any soft areas encountered should be excavated and replaced with select, imported structural fill. Alternately, the floors could be constructed as a framed floor atop a crawlspace.

Even where the exposed soils appear dry, water vapor will tend to naturally migrate upward through the soil to the new constructed space above it. This can affect moisture-sensitive flooring, cause imperfections or damage to the slab, or simply allow excessive water vapor into the space above the slab. All interior slabs-on-grade should be underlain by a capillary break drainage layer consisting of a minimum 4-inch thickness of clean gravel or crushed rock that has a fines content (percent passing the No. 200 sieve) of less than 3 percent and a sand content (percent passing the No. 4 sieve) of no more than 10 percent. Pea gravel or crushed rock are typically used for this layer.

As noted by the American Concrete Institute (ACI) in the *Guides for Concrete Floor and Slab Structures*, proper moisture protection is desirable immediately below any on-grade slab that will be covered by tile, wood, carpet, impermeable floor coverings, or any moisture-sensitive equipment or products. ACI recommends a minimum 10-mil thickness vapor retarder for better durability and long-term performance than is provided by 6-mil plastic sheeting that has historically been used. A vapor retarder is defined as a material with a permeance of less than 0.3 perms, as determined by ASTM E 96. It is possible that concrete admixtures may meet this specification, although the manufacturers of the admixtures should be consulted. Where vapor retarders are used under slabs, their edges should overlap by at least 6 inches and be sealed with adhesive tape. The sheeting should extend to the foundation walls for maximum vapor protection.

If no potential for vapor passage through the slab is desired, a vapor *barrier* should be used. A vapor barrier, as defined by ACI, is a product with a water transmission rate of 0.01 perms when tested in accordance with ASTM E 96. Reinforced membranes having sealed overlaps can meet this requirement.

We recommend that the contractor, the project materials engineer, and the owner discuss these issues and review recent ACI literature and ASTM E-1643 for installation guidelines and guidance on the use of the protection/blotter material.

EXCAVATIONS AND SLOPES

Temporary excavation slopes should not exceed the limits specified in local, state, and national government safety regulations. Also, temporary cuts should be planned to provide a minimum 2 to 3 feet of space for construction of foundations, walls, and drainage. Temporary cuts to a maximum overall depth of about 4 feet may be attempted vertically in unsaturated soil if there are no indications of slope instability. However, vertical cuts should not be made near property boundaries, existing utilities, and structures, or at the base of sloped cuts. Based upon Washington Administrative Code (WAC) 296, Part N, the upper, loose weathered soils encountered in the upper 5 to 6 feet at the subject site would generally be classified as Type B, and the underlying dense, weathered sandstone would generally be classified as Type A. Therefore, temporary cut slopes greater than 4 feet in height should not be excavated at an inclination steeper than 1:1 (Horizontal:Vertical) for Type B soils and 0.75:1 (H:V) for Type A soils, extending continuously between the top and the bottom of a cut. For overall slope heights of less than 12 feet, the cut can manifest itself as a 4-foot vertical cut at the toe of a 1:1 (H:V) slope.

The above-recommended temporary slope inclinations are based on the conditions exposed in our explorations, and on what has been successful at other sites with similar soil conditions. It is possible that variations in soil and groundwater conditions will require modifications to the inclination at which temporary slopes can stand. Temporary cuts are those that will remain unsupported for a relatively short duration to allow for the construction of foundations, retaining walls, or utilities. Temporary cut slopes should be protected with plastic sheeting during wet weather. It is also important that surface runoff be directed away from the top of temporary slope cuts. Cut slopes should also be backfilled or retained as soon as possible to reduce the potential for instability. Please note that loose soil can cave suddenly and without warning. Excavation, foundation, and utility contractors should be made especially aware of this potential danger. These recommendations may need to be modified if the area near the potential cuts has been disturbed in the past by utility installation, or if settlement-sensitive utilities are located nearby.

All permanent cuts into native soil should be inclined no steeper than 2:1 (H:V). Fill slopes should not be constructed with an inclination greater than 3:1 (H:V). To reduce the potential for shallow sloughing, fill must be compacted to the face of these slopes. This can be accomplished by overbuilding the compacted fill and then trimming it back to its final inclination. Adequate compaction of the slope face is important for long-term stability and is necessary to prevent excessive settlement of patios, slabs, foundations, or other improvements that may be placed near the edge of the slope.

Water should not be allowed to flow uncontrolled over the top of any temporary or permanent slope. All permanently exposed slopes should be seeded with an appropriate species of vegetation to reduce erosion and improve the stability of the surficial layer of soil.

Any disturbance to the existing slope outside of the building limits may reduce the stability of the slope. Damage to the existing vegetation and ground should be minimized, and any disturbed areas should be revegetated as soon as possible. Soil from the excavation should not be placed on, or near the top of the steep slopes, and this may require the off-site disposal of any surplus soil.

DRAINAGE CONSIDERATIONS

Footing drains should be used where: (1) crawl spaces or basements will be below a structure; (2) a slab is below the outside grade; or (3) the outside grade does not slope downward from a building. Drains should also be placed at the base of all earth-retaining walls. These drains should be surrounded by at least 6 inches of 1-inch-minus, washed rock that is encircled with non-woven, geotextile filter fabric (Mirafi 140N, Supac 4NP, or similar material). At its highest point, a perforated pipe invert should be at least 6 inches below the bottom of a slab floor or the level of a crawl space. The discharge pipe for subsurface drains should be sloped for flow to the outlet point. Roof and surface water drains must not discharge into the foundation drain system. A typical footing drain detail is attached to this report as Plate 5. For the best long-term performance, perforated PVC pipe is recommended for all subsurface drains. Clean-outs should be provided for potential future flushing or cleaning of footing drains.

Drainage inside the building's footprint should also be provided where (1) a crawl space or slab will slope or be lower than the surrounding ground surface, (2) an excavation encounters significant seepage, or (3) an excavation for a building will be close to the expected high groundwater elevations. We can provide recommendations for interior drains, should they become necessary, during excavation and foundation construction.

As a minimum, a vapor retarder, as defined in the ***Slabs-On-Grade*** section, should be provided in any crawl space area to limit the transmission of water vapor from the underlying soils. Crawl space grades are sometimes left near the elevation of the bottom of the footings. As a result, an outlet drain is recommended for all crawl spaces to prevent an accumulation of any water that may bypass the footing drains. Providing a few inches of free draining gravel underneath the vapor retarder is also prudent to limit the potential for seepage to build up on top of the vapor retarder.

No groundwater was observed during our field work. If seepage is encountered in an excavation, it should be drained from the site by directing it through drainage ditches, perforated pipe, or French drains, or by pumping it from sumps interconnected by shallow connector trenches at the bottom of the excavation.

The excavation and site should be graded so that surface water is directed off the site and away from the tops of slopes. Water should not be allowed to stand in any area where foundations, slabs, or pavements are to be constructed. Final site grading in areas adjacent to the new development should slope away at least one to 2 percent, except where the area is paved. Surface drains should be provided where necessary to prevent ponding of water behind foundation or retaining walls. A discussion of grading and drainage related to pervious surfaces near walls and structures is contained in the ***Foundation and Retaining Walls*** section.

GENERAL EARTHWORK AND STRUCTURAL FILL

All building and pavement areas should be stripped of surface vegetation, topsoil, organic soil, and other deleterious material. The stripped or removed materials should not be mixed with any materials to be used as structural fill, but they could be used in non-structural areas, such as landscape beds.

Structural fill is defined as any fill, including utility backfill, placed under, or close to, a building, or in other areas where the underlying soil needs to support loads. All structural fills should be placed in horizontal lifts with a moisture content at, or near, the optimum moisture content. The optimum moisture content is that moisture content that results in the greatest compacted dry density. The moisture content of fill is very important and must be closely controlled during the filling and compaction process. The onsite soils are fine-grained, silty, very poorly drained, and the underlying sandstone is exceedingly difficult to adequately compact for use as structural fill. The onsite soils should not be used as structural fill, or for fill behind backfilled walls. Imported, clean, angular crushed rock should be utilized where needed.

Fills placed on sloping ground should be keyed into the competent, dense, native soils. This is typically accomplished by placing and compacting the structural fill on level benches that are cut into the competent soils. The allowable thickness of the fill lift will depend on the material type selected, the compaction equipment used, and the number of passes made to compact the lift. The loose lift thickness should not exceed 12 inches, but should be thinner if small, hand-operated compactors are used. We recommend testing structural fill as it is placed. If the fill is not sufficiently compacted, it should be recompacted before another lift is placed. This eliminates the need to remove the fill to achieve the required compaction. The following table presents recommended levels of relative compaction for compacted fill:

LOCATION OF FILL PLACEMENT	MINIMUM RELATIVE COMPACTION
Beneath slabs or walkways	95%
Filled slopes and behind retaining walls	90%
Beneath pavements	95% for upper 12 inches of subgrade; 90% below that level

Where: Minimum Relative Compaction is the ratio, expressed in percentages, of the compacted dry density to the maximum dry density, as determined in accordance with ASTM Test Designation D 1557-91 (Modified Proctor).

LIMITATIONS

The conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our exploration and assume that the soil and groundwater conditions encountered in the test pits are representative of subsurface conditions on the site. If the subsurface conditions encountered during construction are significantly different from those observed in our explorations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. Unanticipated conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking samples in test pits. Subsurface conditions can also vary between exploration locations. Such unexpected conditions frequently require making additional expenditures to attain a properly constructed project. It is recommended that the owner consider providing a contingency fund to accommodate such potential extra costs and risks. This is a standard recommendation for all projects.

The recommendations presented in this report are directed toward the protection of only the proposed residence from damage due to slope movement. Predicting the future behavior of steep slopes and the potential effects of development on their stability is an inexact and imperfect science that is currently based mostly on the past behavior of slopes with similar characteristics. Landslides and soil movement can occur on steep slopes before, during, or after the development of property. The owner of any property containing or located close to steep slopes must ultimately accept the possibility that some slope movement could occur, resulting in possible loss of ground or damage to the facilities around the proposed residence.

This report has been prepared for the exclusive use of David and Maria Federman and their representatives, for specific application to this project and site. Our conclusions and recommendations are professional opinions derived in accordance with our understanding of current local standards of practice, and within the scope of our services. No warranty is expressed or implied. The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design. Our services also do not include assessing or minimizing the potential for biological hazards, such as mold, bacteria, mildew, and fungi in either the existing or proposed site development.

ADDITIONAL SERVICES

Geotech Consultants, Inc. should be retained to provide geotechnical consultation, testing, and observation services during construction. This is to confirm that subsurface conditions are consistent with those indicated by our exploration, to evaluate whether earthwork and foundation construction activities comply with the general intent of the recommendations presented in this report, and to provide suggestions for design changes in the event subsurface conditions differ from those anticipated prior to the start of construction. However, our work would not include the supervision or direction of the actual work of the contractor and its employees or agents. Also, job and site safety, and dimensional measurements, will be the responsibility of the contractor.

During the construction phase, we will provide geotechnical observation and testing services when requested by you or your representatives. Please be aware that we can only document site work we actually observe. It is still the responsibility of your contractor or on-site construction team to verify that our recommendations are being followed, whether we are present at the site or not.

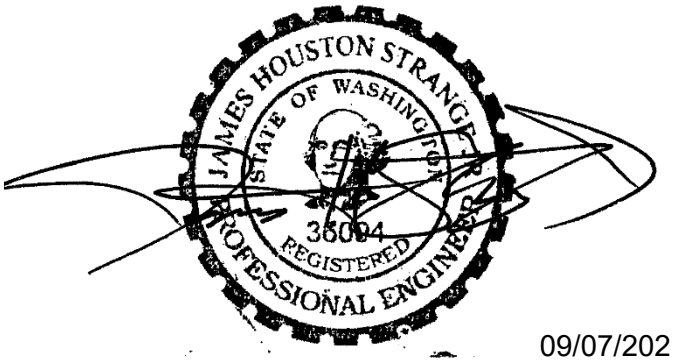
The following plates are attached to complete this report:

Plate 1	Vicinity Map
Plate 2	Site Exploration Plan
Plates 3 - 4	Test Pit Logs
Plate 5	Typical Footing Drain Detail
Appendix A	Slope Stability Analyses

If you have any questions regarding this report, or if we may be of further service, please do not hesitate to contact us.

Respectfully submitted,

GEOTECH CONSULTANTS, INC.



09/07/2021

James H. Strange, P.E.
Associate

cc: **H2D Architecture and Design** – Heidi Helgeson and Lisa Montalvo
via email: Heidi@h2darchitects.com & lisak@h2darchitects.com

(Source: King County iMap)

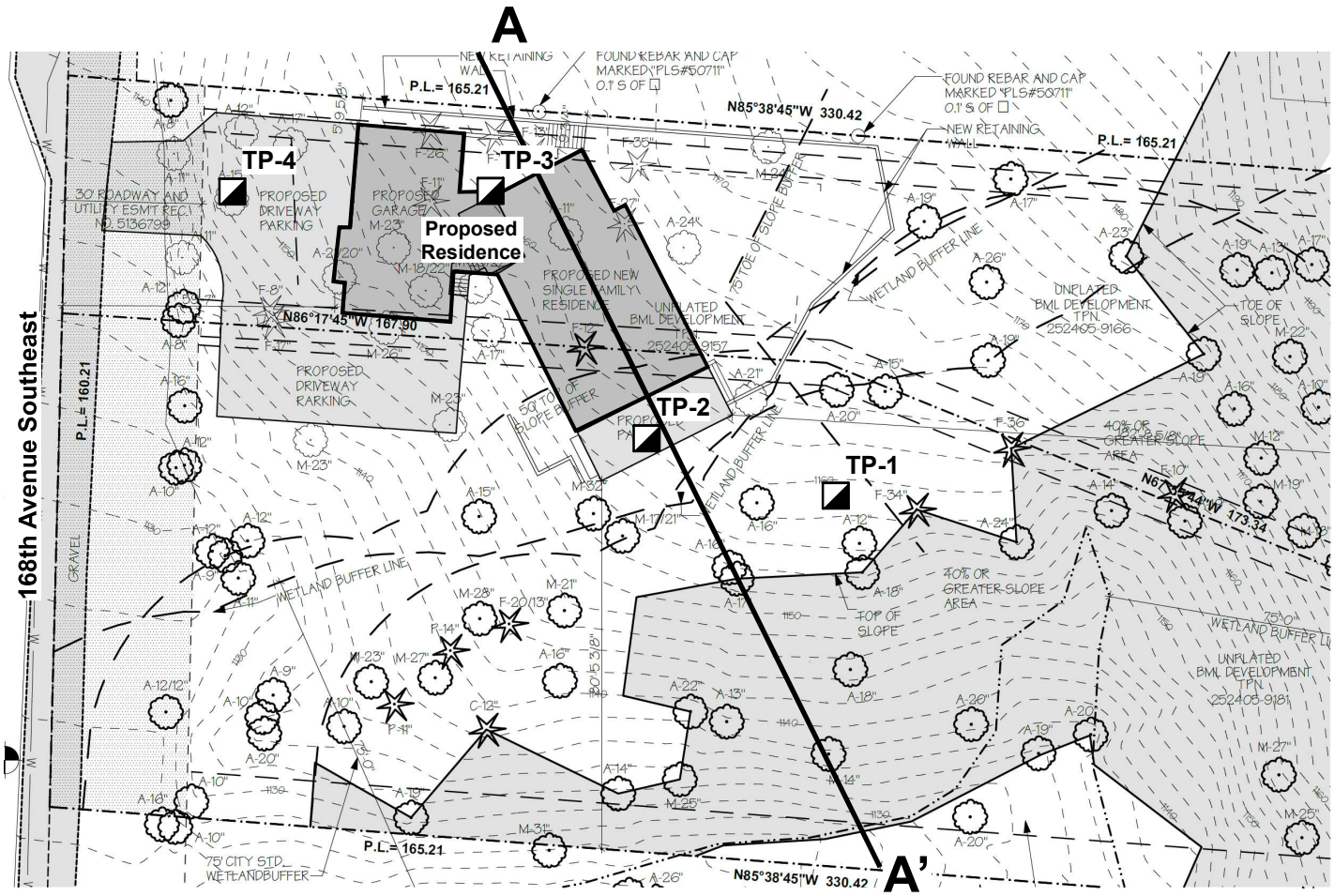
GEOTECH
CONSULTANTS, INC.

VICINITY MAP

6712 & 6716 - 168th Avenue Southeast
Bellevue, Washington

Job No:	Date:		Plate:
21339	Sept. 2021		1

NORTH



Legend:

Test Pit Location

A-A' Slope Stability Cross Section Location

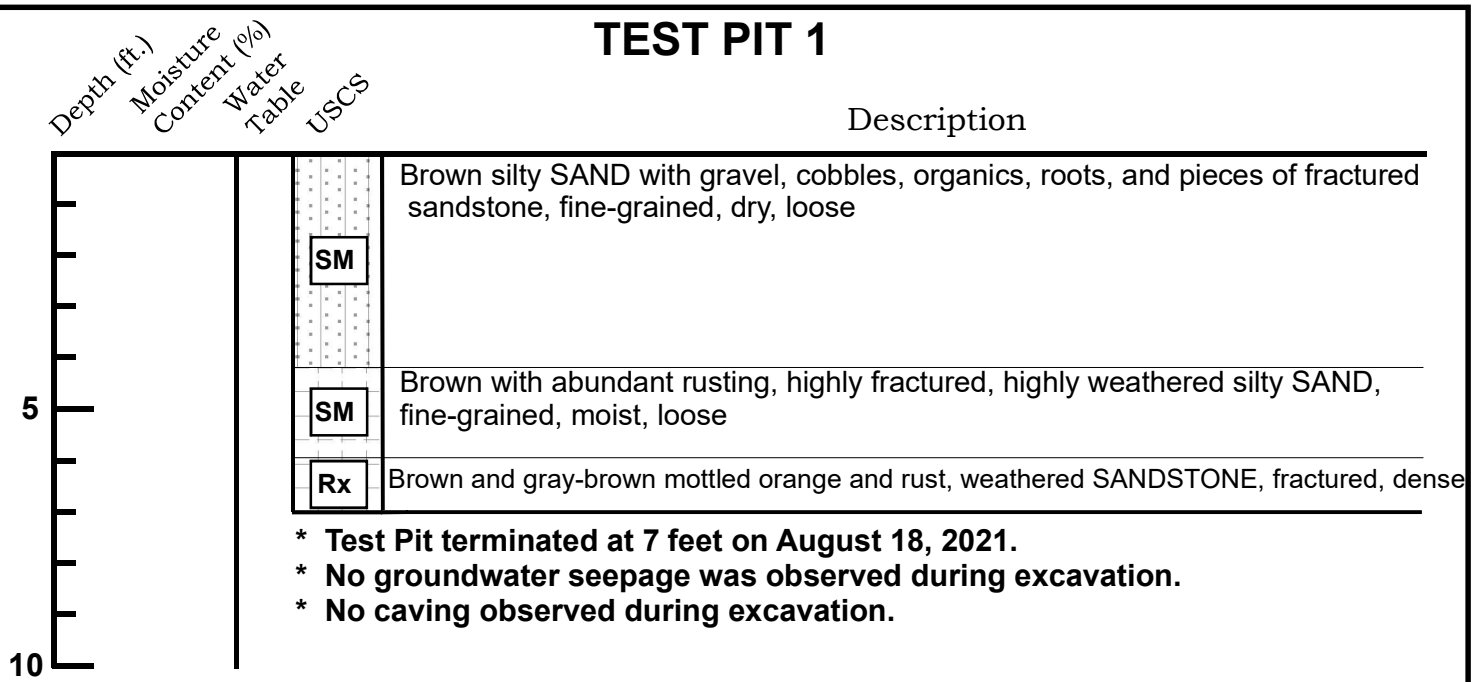
GEOTECH CONSULTANTS, INC.

SITE EXPLORATION PLAN

6712 & 6716 - 168th Avenue Southeast
Bellevue, Washington

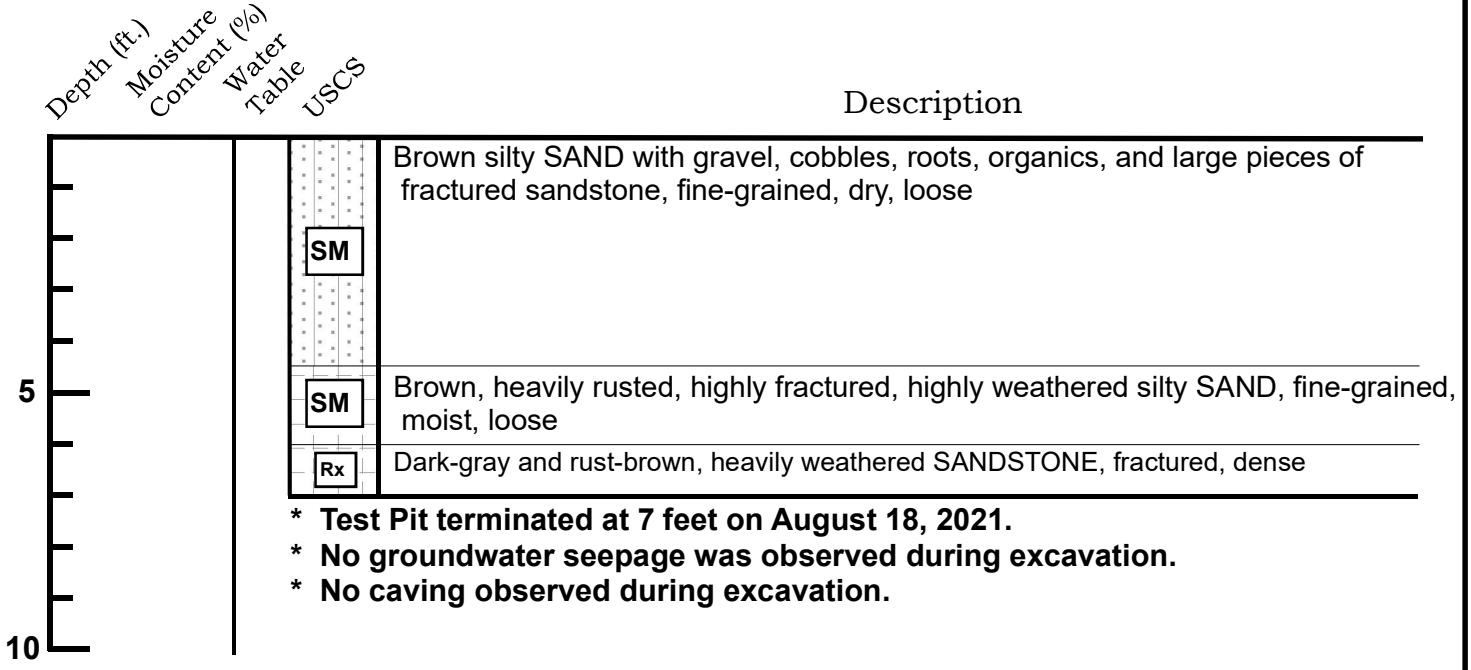
Job No:	Date:		Plate:
21339	Sept. 2021	No Scale	2

TEST PIT 1



* **Test Pit terminated at 7 feet on August 18, 2021.**
* **No groundwater seepage was observed during excavation.**
* **No caving observed during excavation.**

TEST PIT 2



* **Test Pit terminated at 7 feet on August 18, 2021.**
* **No groundwater seepage was observed during excavation.**
* **No caving observed during excavation.**

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TEST PIT LOG

6712 & 6716 - 168th Avenue Southeast
Bellevue, Washington

Job	Date:	Logged by:	Plate:
21339	Sept. 2021	MKM	3

TEST PIT 3

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
			SM	Brown silty SAND with gravel, cobbles, organics, roots, and pieces of fractured sandstone, fine-grained, dry, loose
			SM	Brown with abundant rusting, highly fractured, heavily weathered silty SAND, fine-grained, moist, loose
5			Rx	Brown and gray-brown with abundant mottling, weathered SANDSTONE, fractured, dense -becomes less fractured
10				

*** Test Pit terminated at 7 feet on August 18, 2021.**
*** No groundwater seepage was observed during excavation.**
*** No caving observed during excavation.**

TEST PIT 4

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
			SM	Brown silty SAND with cobbles, gravel, roots, organics, and pieces of fractured sandstone, fine-grained, dry, loose
			SM	Brown, heavily rusted, highly fractured, heavily weathered silty SAND, fine-grained, moist, loose
5			Rx	Brown, heavily mottled and rusted, weathered SANDSTONE, fractured, dense
10				

*** Test Pit terminated at 7 feet on August 18, 2021.**
*** No groundwater seepage was observed during excavation.**
*** No caving observed during excavation.**

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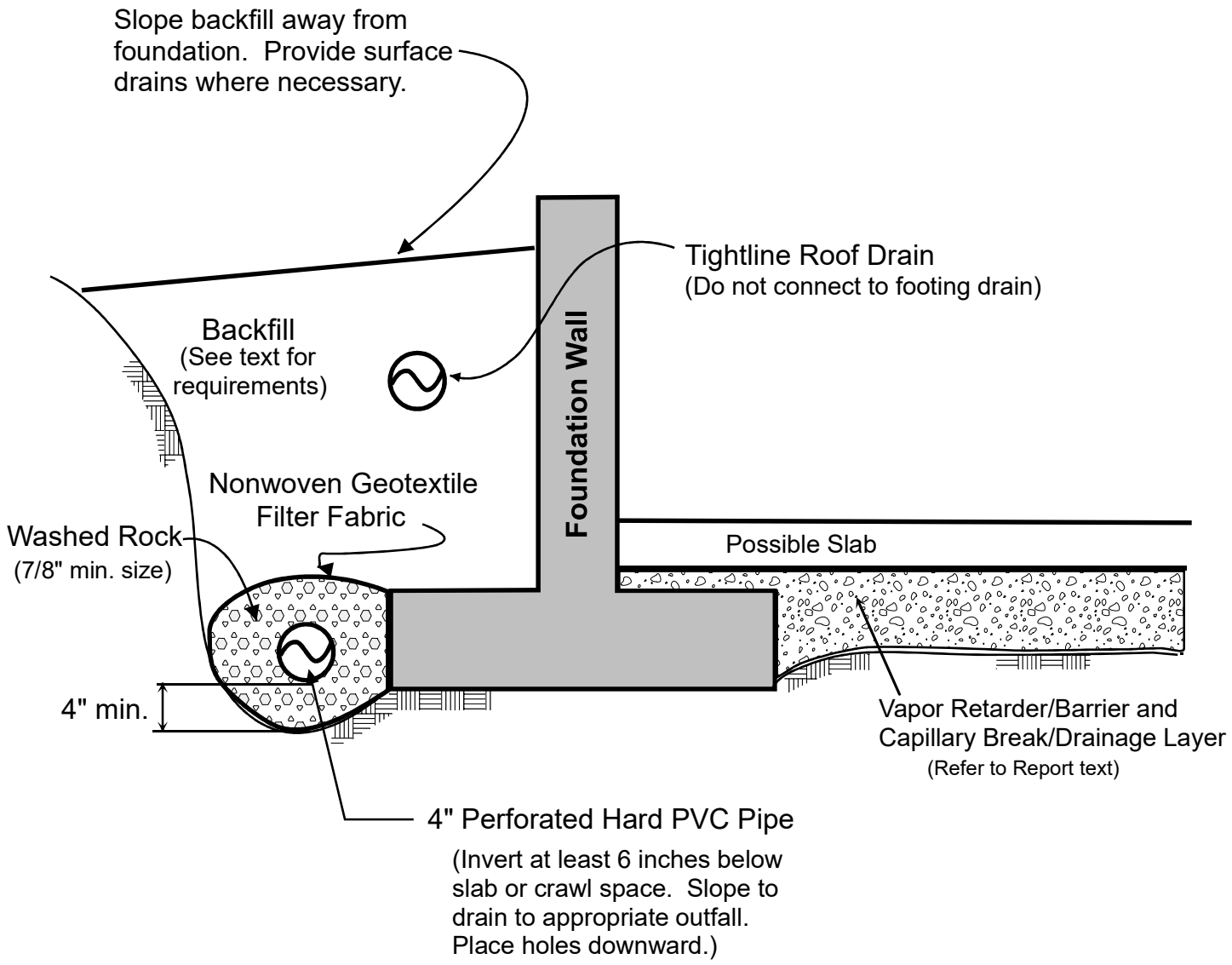
TEST PIT LOG

6712 & 6716 - 168th Avenue Southeast
Bellevue, Washington

Job	Date:	Logged by:	Plate:
21339	Sept. 2021	MKM	4



NOTES:

(1) In crawl spaces, provide an outlet drain to prevent buildup of water that bypasses the perimeter footing drains.

(2) Refer to report text for additional drainage, waterproofing, and slab considerations.

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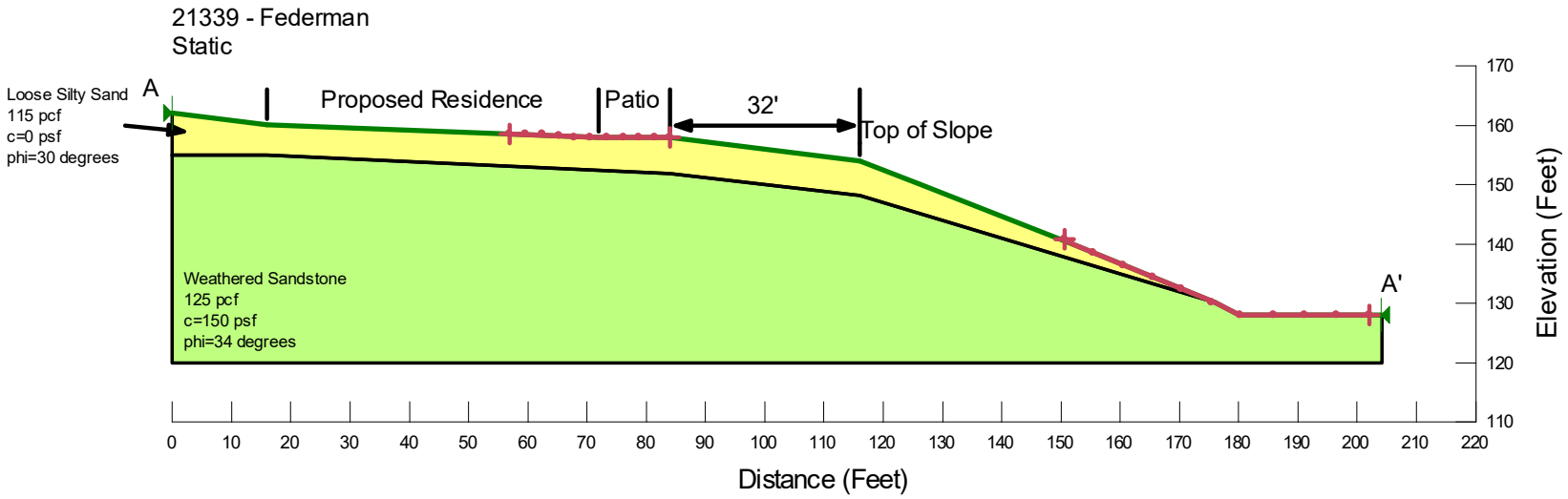
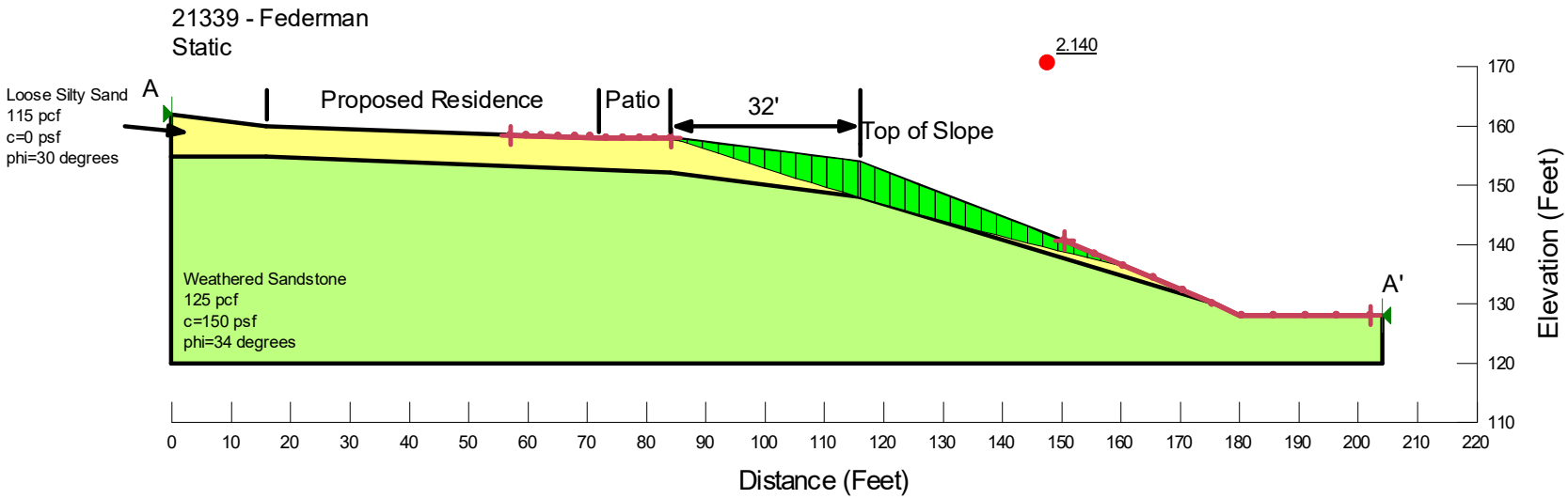
FOOTING DRAIN DETAIL

6712 & 6716 - 168th Avenue Southeast
Bellevue, Washington

Job No:	Date:		Plate:
21339	Sept. 2021		5

Appendix A
Slope Stability Analysis
JN: 21339
David and Maria Federman


21339 - Federman
Static
Loose Silty Sand
115 pcf
c=0 psf
phi=30 degrees
A
Proposed Residence
Patio
32'
Top of Slope
A'
Weathered Sandstone
125 pcf
c=150 psf
phi=34 degrees
170
160
150
140
130
120
110
Elevation (Feet)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
Distance (Feet)


21339 - Federman
Static
2.140
Loose Silty Sand
115 pcf
c=0 psf
phi=30 degrees
A
Proposed Residence
Patio
32'
Top of Slope
A'
Weathered Sandstone
125 pcf
c=150 psf
phi=34 degrees
170
160
150
140
130
120
110
Elevation (Feet)
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220
Distance (Feet)

Static

File Information

File Version: 8.15
Title: 21339- Federman
Created By: Matt McGinnis
Last Edited By: Matt McGinnis
Revision Number: 6
Date: 8/30/2021
Time: 7:53:32 AM
Tool Version: 8.15.6.13446
File Name: 21339 A A'.gsz
Directory: C:\Users\MattM\OneDrive - Geotech Consultants\Slope Stability Analysis\21339 Federman\
Last Solved Date: 8/30/2021
Last Solved Time: 7:53:36 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

Static

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Resisting Side Maximum Convex Angle: 1 °
- Driving Side Maximum Convex Angle: 5 °
- Optimize Critical Slip Surface Location: No
- Tension Crack
  - Tension Crack Option: (none)

F of S Distribution
- F of S Calculation Option: Constant

Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Loose Silty Sand

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 30 °
Phi-B: 0 °

Weathered Sandstone

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 34 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (57, 158.53571) ft
Left-Zone Right Coordinate: (84.19386, 157.97577) ft
Left-Zone Increment: 10
Right Projection: Range
Right-Zone Left Coordinate: (150.45366, 140.59475) ft
Right-Zone Right Coordinate: (202, 128) ft
Right-Zone Increment: 10
Radius Increments: 10

Slip Surface Limits

Left Coordinate: (0, 162) ft
Right Coordinate: (204, 128) ft

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	162
Point 2	16	160

Point 3	72	158
Point 4	84	158
Point 5	116	154
Point 6	126	150
Point 7	152	140
Point 8	176	130
Point 9	180	128
Point 10	204	128
Point 11	0	120
Point 12	116	148
Point 13	116	146
Point 14	84	152
Point 15	84	150
Point 16	16	155
Point 17	16	153
Point 18	0	155
Point 19	204	120

Regions

	Material	Points	Area (ft²)
Region 1	Loose Silty Sand	1,2,3,4,5,6,7,8,12,14,16,18	840
Region 2	Weathered Sandstone	18,11,19,10,9,8,12,14,16	5,166

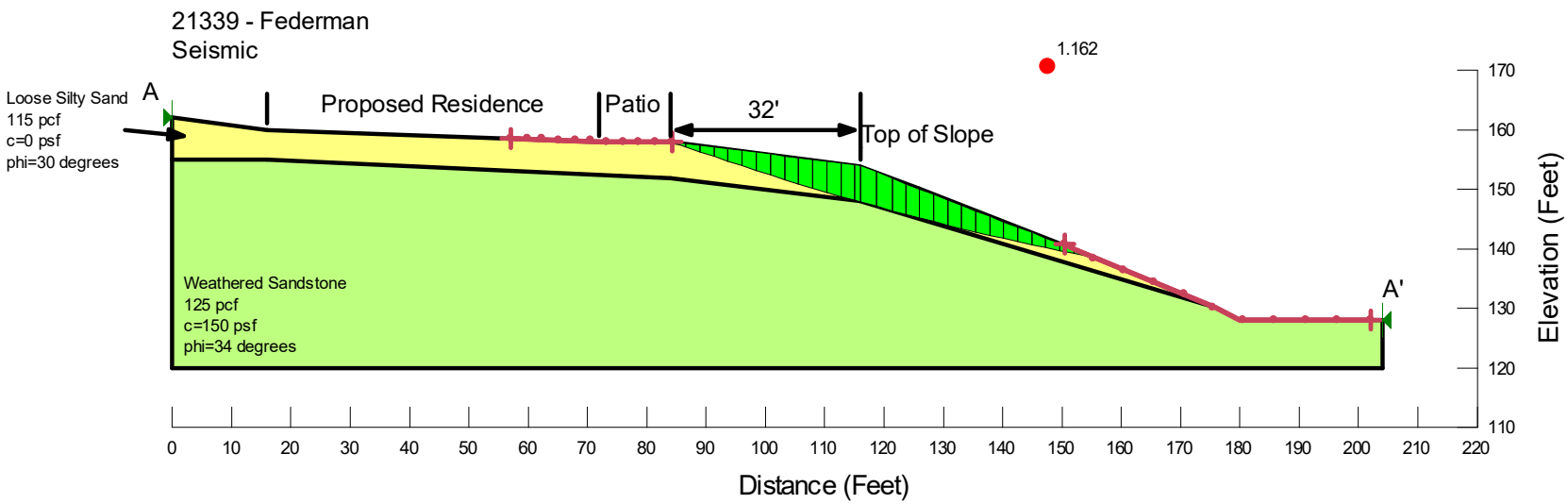
Current Slip Surface

Slip Surface: 1,321
F of S: 2.140
Volume: 250.09718 ft³
Weight: 28,762.826 lbs
Resisting Moment: 13,199,096 lbs-ft
Activating Moment: 6,166,448 lbs-ft
Resisting Force: 16,207.049 lbs
Activating Force: 7,575.2394 lbs
F of S Rank (Analysis): 1 of 1,331 slip surfaces
F of S Rank (Query): 1 of 1,331 slip surfaces
Exit: (161.09094, 136.21211) ft
Entry: (84.19386, 157.97577) ft
Radius: 783.00333 ft
Center: (335.59698, 899.52191) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	85.504844	157.53389	0	29.306149	16.919913	0
Slice 2	88.126814	156.65529	0	87.460518	50.495353	0
Slice 3	90.748783	155.78697	0	144.64163	83.508884	0
Slice 4	93.370753	154.92889	0	200.84988	115.96073	0
Slice 5	95.992723	154.08102	0	256.08562	147.8511	0
Slice 6	98.614692	153.24333	0	310.3492	179.18019	0
Slice 7	101.23666	152.41578	0	363.64092	209.94818	0
Slice 8	103.85863	151.59834	0	415.96105	240.15522	0

Slice 9	106.4806	150.79097	0	467.30985	269.80147	0
Slice 10	109.10257	149.99365	0	517.68753	298.88703	0
Slice 11	111.72454	149.20633	0	567.09429	327.41204	0
Slice 12	114.34651	148.42899	0	615.53028	355.37658	0
Slice 13	115.82875	147.99273	0	622.55671	419.9198	100
Slice 14	117.25386	147.57857	0	611.70471	412.60004	100
Slice 15	119.76158	146.85492	0	582.76182	393.07781	100
Slice 16	122.26158	146.1425	0	571.90046	330.18688	0
Slice 17	124.75386	145.4412	0	540.80039	312.23125	0
Slice 18	127.3	144.73402	0	510.11797	294.51675	0
Slice 19	129.9	144.02132	0	479.81358	277.0205	0
Slice 20	132.5	143.31822	0	448.42098	258.89597	0
Slice 21	135.1	142.62472	0	415.94026	240.14322	0
Slice 22	137.7	141.94077	0	382.3715	220.76229	0
Slice 23	140.3	141.26635	0	347.71472	200.75319	0
Slice 24	142.9	140.60144	0	311.96992	180.11592	0
Slice 25	145.5	139.94601	0	275.13705	158.85045	0
Slice 26	148.1	139.30003	0	237.21603	136.95674	0
Slice 27	150.7	138.6635	0	198.20672	114.4347	0
Slice 28	153.13637	138.07528	0	156.76029	90.505598	0
Slice 29	155.4091	137.53426	0	112.99989	65.240517	0
Slice 30	157.68184	137.0004	0	68.394933	39.487833	0
Slice 31	159.95457	136.47368	0	22.945255	13.247449	0


21339 - Federman
Seismic
1.162
Loose Silty Sand
115 pcf
c=0 psf
phi=30 degrees
A
Proposed Residence
Patio
32'
Top of Slope
A'
Weathered Sandstone
125 pcf
c=150 psf
phi=34 degrees
170
160
150
140
130
120
110
Elevation (Feet)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
Distance (Feet)

Seismic

File Information

File Version: 8.15
Title: 21339- Federman
Created By: Matt McGinnis
Last Edited By: Matt McGinnis
Revision Number: 6
Date: 8/30/2021
Time: 7:53:32 AM
Tool Version: 8.15.6.13446
File Name: 21339 A A'.gsz
Directory: C:\Users\MattM\OneDrive - Geotech Consultants\Slope Stability Analysis\21339 Federman\
Last Solved Date: 8/30/2021
Last Solved Time: 7:53:36 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

Seismic

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Resisting Side Maximum Convex Angle: 1 °
- Driving Side Maximum Convex Angle: 5 °
- Optimize Critical Slip Surface Location: No
- Tension Crack
  - Tension Crack Option: (none)

F of S Distribution
- F of S Calculation Option: Constant

Advanced
- Number of Slices: 30
- F of S Tolerance: 0.001
- Minimum Slip Surface Depth: 0.1 ft
- Search Method: Root Finder
- Tolerable difference between starting and converged F of S: 3
- Maximum iterations to calculate converged lambda: 20
- Max Absolute Lambda: 2

Materials

Loose Silty Sand
- Model: Mohr-Coulomb
- Unit Weight: 115 pcf
- Cohesion': 0 psf
- Phi': 30 °
- Phi-B: 0 °

Weathered Sandstone
- Model: Mohr-Coulomb
- Unit Weight: 125 pcf
- Cohesion': 100 psf
- Phi': 34 °
- Phi-B: 0 °

Slip Surface Entry and Exit
- Left Projection: Range
- Left-Zone Left Coordinate: (57, 158.53571) ft
- Left-Zone Right Coordinate: (84.19386, 157.97577) ft
- Left-Zone Increment: 10
- Right Projection: Range
- Right-Zone Left Coordinate: (150.45366, 140.59475) ft
- Right-Zone Right Coordinate: (202, 128) ft
- Right-Zone Increment: 10
- Radius Increments: 10

Slip Surface Limits
- Left Coordinate: (0, 162) ft
- Right Coordinate: (204, 128) ft

Seismic Coefficients
- Horz Seismic Coef.: 0.23

Points

	X (ft)	Y (ft)
Point 1	0	162
Point 2	16	160

Point 3	72	158
Point 4	84	158
Point 5	116	154
Point 6	126	150
Point 7	152	140
Point 8	176	130
Point 9	180	128
Point 10	204	128
Point 11	0	120
Point 12	116	148
Point 13	116	146
Point 14	84	152
Point 15	84	150
Point 16	16	155
Point 17	16	153
Point 18	0	155
Point 19	204	120

Regions

	Material	Points	Area (ft²)
Region 1	Loose Silty Sand	1,2,3,4,5,6,7,8,12,14,16,18	840
Region 2	Weathered Sandstone	18,11,19,10,9,8,12,14,16	5,166

Current Slip Surface

Slip Surface: 1,222
F of S: 1.162
Volume: 236.31792 ft³
Weight: 27,181.17 lbs
Resisting Moment: 7,414,343.9 lbs-ft
Activating Moment: 6,378,417.2 lbs-ft
Resisting Force: 14,768.707 lbs
Activating Force: 12,704.269 lbs
F of S Rank (Analysis): 3 of 1,331 slip surfaces
F of S Rank (Query): 3 of 1,331 slip surfaces
Exit: (155.46719, 138.55534) ft
Entry: (84.19386, 157.97577) ft
Radius: 484.17256 ft
Center: (246.74554, 614.04596) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	85.382942	157.55544	0	26.178416	15.114116	0
Slice 2	87.761107	156.72175	0	76.540901	44.19091	0
Slice 3	90.139272	155.90191	0	123.75784	71.451625	0
Slice 4	92.517437	155.09587	0	168.17662	97.096815	0
Slice 5	94.895602	154.30354	0	210.20995	121.36477	0
Slice 6	97.273767	153.52485	0	250.3338	144.53029	0
Slice 7	99.651932	152.75973	0	289.08273	166.90199	0
Slice 8	102.0301	152.00813	0	327.04066	188.81701	0

Slice 9	104.40826	151.26997	0	364.8246	210.63158	0
Slice 10	106.78643	150.54518	0	403.05906	232.70626	0
Slice 11	109.16459	149.83371	0	442.34	255.38512	0
Slice 12	111.54276	149.13549	0	483.18861	278.96908	0
Slice 13	113.92092	148.45047	0	525.9981	303.68514	0
Slice 14	115.555	147.98599	0	725.50266	489.35772	100
Slice 15	117.35096	147.48606	0	732.97175	494.39569	100
Slice 16	120.05287	146.74512	0	714.99025	482.26701	100
Slice 17	122.55287	146.07391	0	514.56875	297.0864	0
Slice 18	124.85096	145.47007	0	491.23283	283.61341	0
Slice 19	127.18182	144.86998	0	467.77848	270.07203	0
Slice 20	129.54545	144.27397	0	443.64446	256.13825	0
Slice 21	131.90909	143.69059	0	416.89502	240.69445	0
Slice 22	134.27273	143.11979	0	387.19552	223.54744	0
Slice 23	136.63636	142.56153	0	354.39681	204.61109	0
Slice 24	139	142.01577	0	318.54265	183.91068	0
Slice 25	141.36364	141.48246	0	279.85135	161.57225	0
Slice 26	143.72727	140.96157	0	238.67451	137.79879	0
Slice 27	146.09091	140.45304	0	195.4402	112.83745	0
Slice 28	148.45455	139.95684	0	150.59077	86.943621	0
Slice 29	150.81818	139.47293	0	104.52619	60.348227	0
Slice 30	153.73359	138.89469	0	40.52772	23.39869	0

APPENDIX B:
WETLAND DETERMINATION FORMS

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 21147 City/County: City of Bellevue Sampling Date: 5-10-21

Applicant/Owner: David & Maria Federman State: WA Sampling Point: S1

Investigator(s): AR/JG Section, Township, Range: S25, T24N, R05E, W.M.

Landform (hillslope, terrace, etc.): ravine Local relief (concave, convex, none): none Slope (%): 7%

Subregion (LRR): LRR A Lat: 47.5412323 Long: -122.1155902 Datum: NAD 83

Soil Map Unit Name: Beausite gravelly sandy loam, 15 to 30% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐ Hydric Soil Present? Yes ☑ No ☐ Wetland Hydrology Present? Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	30	Y	FAC
2. Alnus rubra	15	Y	FAC
3.			
4.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m)			
1. Rubus spectabilis	20	Y	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Tolmiea menziesii	30	Y	FAC
2. Athyrium cyclosorum	5	N	FAC
3. Rubus ursinus	trace	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: 3m)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 65

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 = 0
FACW species	x 2 = 0
FAC species	x 3 = 0
FACU species	x 4 = 0
UPL species	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Lysichiton americanus nearby

SOIL

Sampling Point: S1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					sandy loam	
10-16	10YR 2/1	96	10YR 3/4	2	C	M	sandy loam	
			5YR 4/1	2				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Although this soil profile does not meet a standard hydric soil indicator, the low chroma soils, redoximorphic features, vegetation, and hydrology indicate that the area is saturated or inundated long enough to develop anaerobic conditions in the upper portion of the soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☑ No ☐ Depth (inches): 8"

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 21147 City/County: City of Bellevue Sampling Date: 5-10-21

Applicant/Owner: David & Maria Federman State: WA Sampling Point: S2

Investigator(s): AR/JG Section, Township, Range: S25, T24N, R05E, W.M.

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 55%

Subregion (LRR): LRR A Lat: 47.5412323 Long: -122.1155902 Datum: NAD 83

Soil Map Unit Name: Beausite gravelly sandy loam, 15 to 30% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑ Hydric Soil Present? Yes ☐ No ☑ Wetland Hydrology Present? Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	70	Y	FACU
2.			
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m)			
1. Rubus spectabilis	15	Y	FAC
2. Oemleria cerasiformis	15	Y	FACU
3. Ribes lacustre	5	N	FAC
4.			
5.			
	35	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Polystichum munitum	20	Y	FACU
2. Dicentra formosa	trace	N	FACU
3. Rubus ursinus	trace	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	= Total Cover	
Woody Vine Stratum (Plot size: 3m)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	125 (A)		480 (B)

Prevalence Index = B/A = 4.57

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	97	7.5YR 5/6	3	C	M	sandy loam	
10-16	10YR 3/2	92	7.5YR 5/6	5	C	M	sandy loam	
			10YR 6/3	3	D	M	sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX C:
WETLAND RATING FORM & FIGURES

Clear form Optimizer (Save First!)

Wetland name or number **A**

RATING SUMMARY – Western Washington

Name of wetland (or ID #): 21147 - Wetland A Date of site visit: 5/10/21

Rated by AR, JG Trained by Ecology? ✔ Yes ___No Date of training 10-18/9-15

HGM Class used for rating DEPRESSIONAL Wetland has multiple HGM classes? ✔ Y ____N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map King County

OVERALL WETLAND CATEGORY III (based on functions ✔ or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

✔ **Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M [L]	H [M] L	H [M] L	
Landscape Potential	H [M] L	H [M] L	H [M] L	
Value	[H] M L	H [M] L	[H] M L	**TOTAL**
Score Based on Ratings	**6**	**6**	**7**	**19**

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✔

Wetland name or number **A**

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	1
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	4

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number **A**___

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

☑ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

☑ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   - The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   - At least 30% of the open water area is deeper than 6.6 ft (2 m).

☑ NO – go to 4 ☐ **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   - The wetland is on a slope (*slope can be very gradual*),
   - The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   - The water leaves the wetland **without being impounded**.

☑ NO – go to 5 ☐ **YES –** The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   - The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   - The overbank flooding occurs at least once every 2 years.

Wetland name or number **A**

☑ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

☑ NO – go to 7 ☐ **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ ☑ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated		HGM class to use in rating
Slope + Riverine	☐	Riverine
Slope + Depressional	☑	Depressional
Slope + Lake Fringe	☐	Lake Fringe
Depressional + Riverine along stream within boundary of depression	☐	Depressional
Depressional + Lake Fringe	☐	Depressional
Riverine + Lake Fringe	☐	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number **A**

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: ☐ Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 ☑ Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 ☐ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	**2**
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitio* ☐ .Yes = 4 No = 0 ☑	**0**
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): ☐ Wetland has persistent, ungrazed, plants > 95% of area points = 5 ☐ Wetland has persistent, ungrazed, plants > ½ of area points = 3 ☑ Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 ☐ Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	**1**
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* ☐ Area seasonally ponded is > ½ total area of wetland points = 4 ☐ Area seasonally ponded is > ¼ total area of wetland points = 2 ☑ Area seasonally ponded is < ¼ total area of wetland points = 0	**0**
Total for D 1 Add the points in the boxes above	**3**

Rating of Site Potential If score is: ___ **12-16 = H** ___ **6-11 = M** ✔ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? ☐ Yes = 1 No = 0 ☑	**0**
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? ☑ Yes = 1 No = 0 ☐	**1**
D 2.3. Are there septic systems within 250 ft of the wetland? ☐ Yes = 1 No = 0 ☑	**0**
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ ☐ Yes = 1 No = 0 ☑	**0**
Total for D 2 Add the points in the boxes above	**1**

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ✔ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? ☑ Yes = 1 No = 0 ☐	**1**
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? ☑ Yes = 1 No = 0 ☐	**1**
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? ☐ Yes = 2 No = 0 ☑	**0**
Total for D 3 Add the points in the boxes above	**2**

Rating of Value If score is: ✔ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number **A**

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland:

- ☐ Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4
- ☑ Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2
- ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1
- ☐ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0

2

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

- ☐ Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7
- ☑ Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5
- ☐ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3
- ☐ The wetland is a "headwater" wetland points = 3
- ☐ Wetland is flat but has small depressions on the surface that trap water points = 1
- ☐ Marks of ponding less than 0.5 ft (6 in) points = 0

5

D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*

- ☐ The area of the basin is less than 10 times the area of the unit points = 5
- ☑ The area of the basin is 10 to 100 times the area of the unit points = 3
- ☐ The area of the basin is more than 100 times the area of the unit points = 0
- ☐ Entire wetland is in the Flats class points = 5

3

Total for D 4 — Add the points in the boxes above — **10**

Rating of Site Potential If score is: ___ **12-16 = H** ✔ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges?	☐ Yes = 1 ☐ No = 0 ☑	**0**
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	☑ Yes = 1 ☐ No = 0	**1**
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	☑ Yes = 1 ☐ No = 0	**1**
Total for D 5 — Add the points in the boxes above		**2**

Rating of Landscape Potential If score is: ___ **3 = H** ✔ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*
The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):

- ☐ • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2
- ☑ • Surface flooding problems are in a sub-basin farther down-gradient. points = 1
- ☐ Flooding from groundwater is an issue in the sub-basin. points = 1
- ☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0
- ☐ There are no problems with flooding downstream of the wetland. points = 0

1

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? ☐ Yes = 2 ☐ No = 0 ☑ — **0**

Total for D 6 — Add the points in the boxes above — **1**

Rating of Value If score is: ___ **2-4 = H** ✔ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number **A**

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

____Aquatic bed
____Emergent
____Scrub-shrub (areas where shrubs have > 30% cover)
✔ Forested (areas where trees have > 30% cover)

☐ 4 structures or more: points = 4
☐ 3 structures: points = 2
✔ 2 structures: points = 1
☐ 1 structure: points = 0

If the unit has a Forested class, check if:

✔ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

1

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

✔ Permanently flooded or inundated
____Seasonally flooded or inundated
____Occasionally flooded or inundated
✔ Saturated only
____Permanently flowing stream or river in, or adjacent to, the wetland
____Seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland**
____**Freshwater tidal wetland**

☐ 4 or more types present: points = 3
☐ 3 types present: points = 2
✔ 2 types present: points = 1
☐ 1 type present: points = 0

☐ **2 points**
☐ **2 points**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

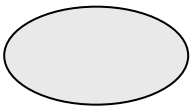
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species ☐ points = 2
5 - 19 species ✔ points = 1
< 5 species ☐ points = 0

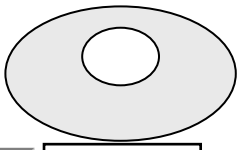
1

H 1.4. Interspersion of habitats

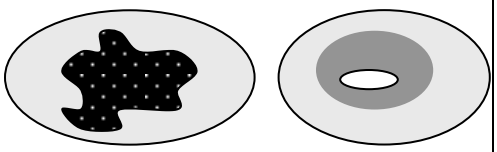
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



☐ **None** = 0 points

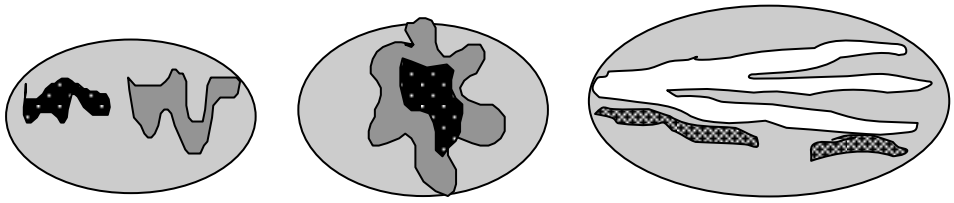


✔ **Low** = 1 point



☐ **Moderate** = 2 points

All three diagrams in this row ☐ are **HIGH** = 3points



1

Wetland name or number **A**

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ✔ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ✔ Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ✔ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	**3**
Total for H 1 Add the points in the boxes above	**7**

Rating of Site Potential If score is: ___ **15-18 = H** ✔ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 1 **+** [(% moderate and low intensity land uses)/2] 0 **=** 1 % If total accessible habitat is: ☐ > 1/3 (33.3%) of 1 km Polygon points = 3 ☐ 20-33% of 1 km Polygon points = 2 ☐ 10-19% of 1 km Polygon points = 1 ✔ < 10% of 1 km Polygon points = 0	**0**
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 48 **+** [(% moderate and low intensity land uses)/2] 5 **=** 53 % ✔ Undisturbed habitat > 50% of Polygon points = 3 ☐ Undisturbed habitat 10-50% and in 1-3 patches points = 2 ☐ Undisturbed habitat 10-50% and > 3 patches points = 1 ☐ Undisturbed habitat < 10% of 1 km Polygon points = 0	**3**
H 2.3. Land use intensity in 1 km Polygon: If ☐ > 50% of 1 km Polygon is high intensity land use points = (- 2) ✔ ≤ 50% of 1 km Polygon is high intensity points = 0	**0**
Total for H 2 Add the points in the boxes above	**3**

Rating of Landscape Potential If score is: ___ **4-6 = H** ✔ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ✔ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ☐ Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 ☐ Site does not meet any of the criteria above points = 0	**2**

Rating of Value If score is: ✔ **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number **A**

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☑ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number **A**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes –Go to **SC 1.1** ☑ No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ ☐ Yes = **Category I** ☐ No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes **–** Go to **SC 2.2** ☑ No **–** Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☑ ☐ Yes **= Category I** ☐ No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ ☐ Yes **– Contact WNHP/WDNR and go to SC 2.4** ☑ No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ ☐ Yes **= Category I** ☐ No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes – Go to **SC 3.3** ☑ No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ ☐ Yes – Go to **SC 3.3** ☑ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ ☐ Yes = **Is a Category I bog** ☐ No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐ ☐ Yes = **Is a Category I bog** ☐ No **= Is not a bog**	**Cat. I**

Wetland name or number **A**

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

☐ Yes = **Category I** ☑ No = **Not a forested wetland for this section** — **Cat. I**

SC 5.0. Wetlands in Coastal Lagoons

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)*

☐ Yes – Go to **SC 5.1** ☑ No = **Not a wetland in a coastal lagoon** — **Cat. I**

SC 5.1. Does the wetland meet all of the following three conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

☐ ☐ Yes = **Category I** ☐ No = **Category II** — **Cat. II**

SC 6.0. Interdunal Wetlands

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109

☐ Yes – Go to **SC 6.1** ☑ No = **not an interdunal wetland for rating** — **Cat I**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

☐ ☐ Yes = **Category I** ☐ No – Go to **SC 6.2** — **Cat. II**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

☐ ☐ Yes = **Category II** ☐ No – Go to **SC 6.3** — **Cat. III**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

☐ ☐ Yes = **Category III** ☐ No = **Category IV** — **Cat. IV**

Category of wetland based on Special Characteristics

If you answered No for all types, enter "Not Applicable" on Summary Form — **N/A**

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FEDERMAN - 168TH AVE SE

WETLAND RATING FIGURE 1- WETLAND A

LEGEND

- FORESTED VEGETATION
- SATURATED ONLY
- SEASONALLY FLOODED
- PERMANENTLY FLOODED
- 150' FROM WL BOUNDARY
- PERENNIAL STREAM

Scale 1" = 100'

0 50 100 150 200

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Email: mailbox@wetlandresources .com

WETLAND RATING
Wetland A

David and Maria Federman
5508 NE 7th Place
Renton, WA 98059

Figure A-1
WRI Job # 21147
Rated by: JG

FEDERMAN - 168TH AVE SE

WETLAND RATING FIGURE 2- WETLAND A

LEGEND

- RELATIVELY UNDISTURBED
- LOW/MOD. INTENSITY
- HIGH INTENSITY
- ACCESSIBLE HABITAT
- WETLAND
- 1 KM FROM WETLAND
- CONTRIBUTING BASIN

CONTRIBUTING BASIN AREA RELATIVE TO WETLAND UNIT IS 52.4:1

Scale 1" = 1,000'

0 1,000 2,000

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WETLAND RATING

Wetland A

David and Maria Federman
5508 NE 7th Place
Renton, WA 98059

Figure A-2
WRI Job # 21147
Rated by: JG

FEDERMAN - 168TH AVE SE

WETLAND RATING FIGURE 3- WETLAND A

LEGEND

WETLAND

AQUATIC RESOURCES ON THE 303(d) LIST

Scale 1" = 2,000'

0 2,000 4,000

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WETLAND RATING
Wetland A

David and Maria Federman
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Figure A-3
WRI Job # 21147
Rated by: JG

FEDERMAN - 168TH AVE SE

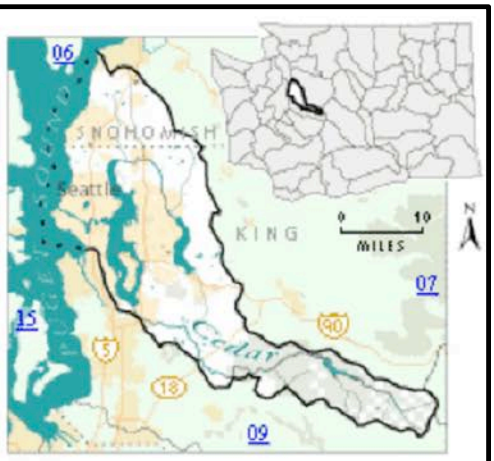
WETLAND RATING FIGURE 4- WETLAND A

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- King
- Snohomish



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrjcek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svrjcek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036

** ***Status*** *will be listed as one of the following: Approved by EPA, Under Development or Implementation*

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WETLAND RATING
Wetland A

David and Maria Federman Figure A-4
5508 NE 7th Place WRI Job # 21147
Renton, WA 98059 Rated by: JG

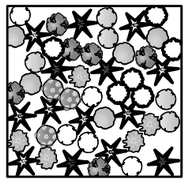
APPENDIX D:
CRITICAL AREAS REPORT & BUFFER MITIGATION PLAN MAP

CRITICAL AREAS REPORT & BUFFER MITIGATION PLAN MAP

FEDERMAN - 168TH AVE SE

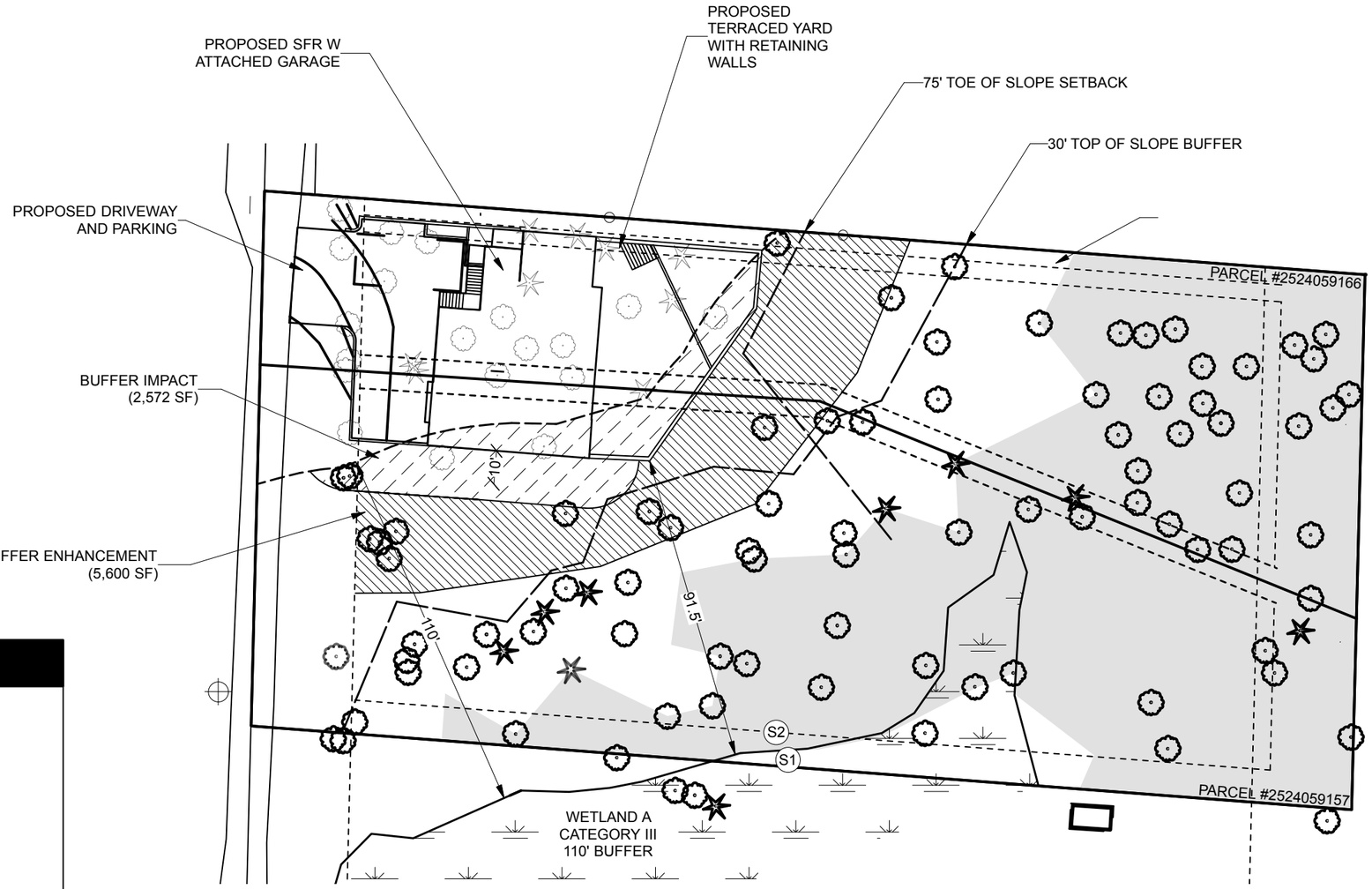
PORTION OF SECTION 25, TOWNSHIP 24N, RANGE 05E, W.M.

BUFFER ENHANCEMENT AREA
PLANTING DETAIL EXAMPLE



TREES AND SHRUBS TO BE INTERSPERSED
AMONG EXISTING NATIVE PLANTS

- DOUGLAS FIR
- WESTERN RED CEDAR
- WESTERN HEMLOCK
- VINE MAPLE
- BEAKED HAZELNUT
- OCEAN SPRAY
- OSOBERRY
- SALMONBERRY
- RED ELDERBERRY
- SNOWBERRY



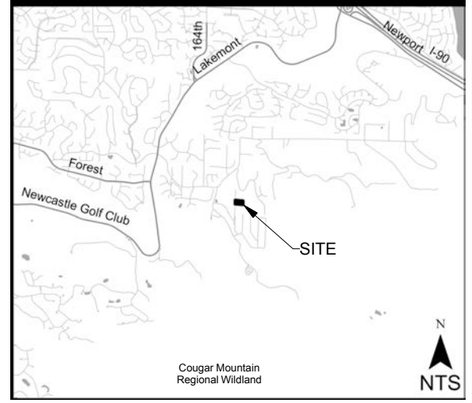
LEGEND

- WETLAND
- STEEP SLOPE
- WETLAND BUFFER
- 30' TOP OF SLOPE BUFFER
- 75' TOE OF SLOPE SETBACK
- BSBL
- EXISTING CONIFERS TO REMAIN
- EXISTING DECIDUOUS TO REMAIN
- BUFFER IMPACT
- BUFFER ENHANCEMENT
- (S1) - (S2) DATA SITES

Scale 1" = 40'

0 20 40 60 80

VICINITY MAP



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CRITICAL AREAS REPORT & BUFFER
MITIGATION PLAN MAP
FEDERMAN - 168TH AVE SE
CITY OF BELLEVUE

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Sheet 1/1
WRI #: 21147
Drawn by: JG
Date: 10.27.2021